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**CLARK FORK RIVER
MACROINVERTEBRATE COMMUNITY BIOINTEGRITY:
1995 ASSESSMENT**

**prepared for
Montana Department of Environmental Quality
Planning, Prevention and Assistance Division**

**prepared by
Daniel L. McGuire
McGuire Consulting**

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SUMMARY

The Montana Department of Environmental Quality has conducted annual macroinvertebrate surveys in the Clark Fork River Basin since 1986. Each August, we assess biological integrity and evaluate water quality at 25 sites from the headwaters to Thompson Falls Reservoir. Our analysis was developed specifically for the Clark Fork River drainage and compares each station to a fixed reference condition. The analysis integrates ten measures of macroinvertebrate structure and function into a single index of biological integrity. In addition, subsets of indices sensitive to metals pollution or to nutrient and organic pollution estimate the relative severity of these pollutants. In this report, the 1995 data are presented and analyzed. With 10 years of data for most monitoring sites, a detailed picture of environmental health and water quality trends in the Clark Fork Basin has developed.

Since 1986, the biological integrity of macroinvertebrate assemblages has reflected a wide range of environmental conditions and water quality in the Clark Fork River drainage. On a scale of 0 to 100% (with values greater than 90% indicating nonimpairment), biointegrity ranged from 13 to 98% within the study area. A consistent pattern of impairment existed during all 10 years of monitoring. Biointegrity was lowest in Silver Bow Creek. Benthic assemblages were slightly to moderately impaired in the upper Clark Fork River, but were much healthier than in Silver Bow Creek. Biological condition generally improved from the Clark Fork's headwaters downstream to Turah. This pattern was interrupted by slight declines in biointegrity from Deer Lodge to the Little Blackfoot River and again from Bearmouth to Bonita. Downstream from Missoula, the Clark Fork River was slightly impaired in most years.

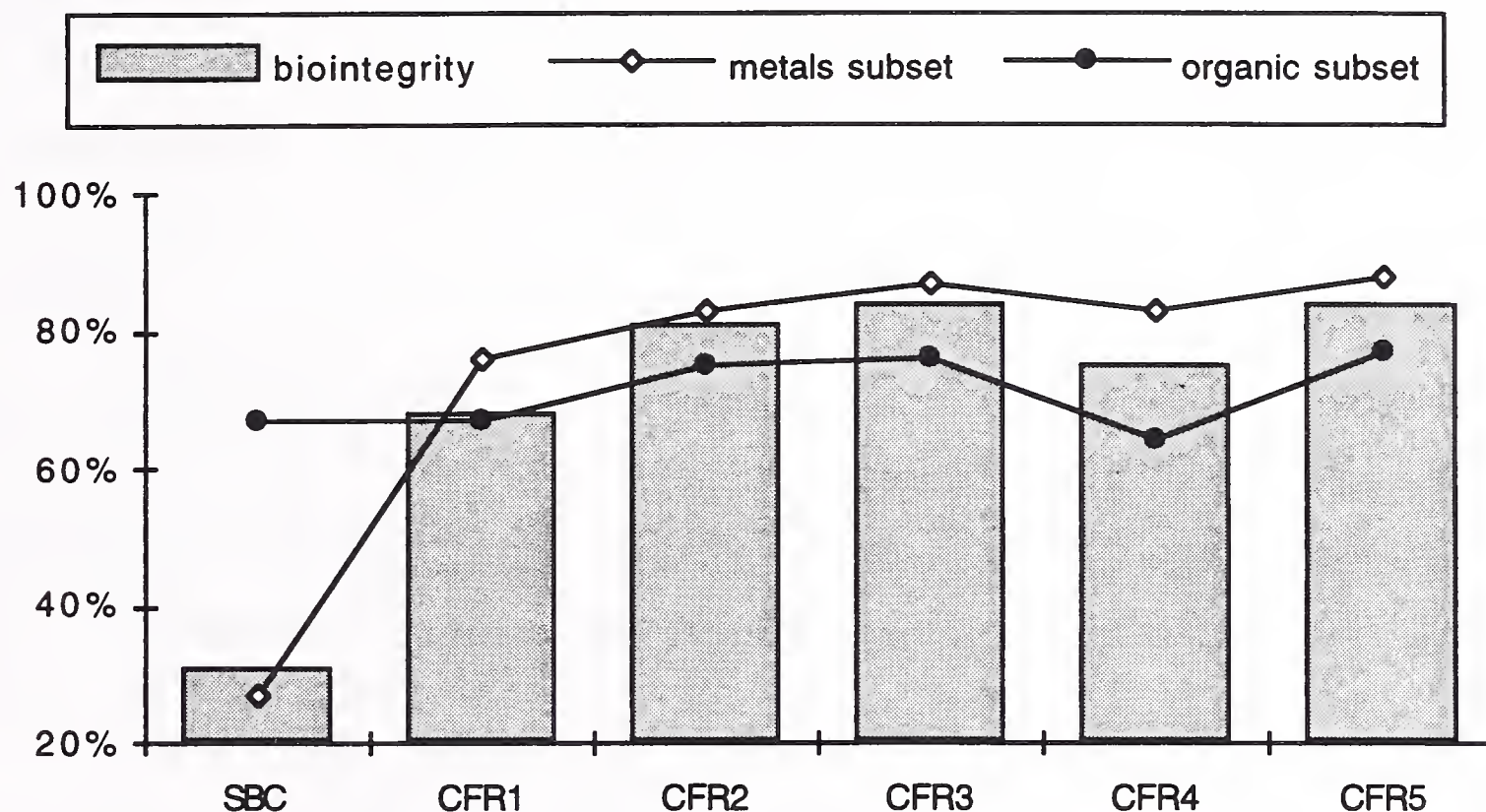
Metals pollution was severe in Silver Bow Creek and was usually detectable in the Clark Fork River as far as the confluence of the Little Blackfoot River. The upper Clark Fork River typically experienced slight metals-related impacts. Metals pollution was occasionally indicated as far downstream as Missoula. Nutrient and organic pollution suppressed biointegrity slightly throughout the Clark Fork mainstem and in the lower Bitterroot River and Flint Creek. Increased nutrient/organic pollution was evident in the Clark Fork from the confluence of the Bitterroot River to Huson. Impacts in this reach were attributed to nutrients from the Missoula WWTP, the Bitterroot River, and the Stone Container kraft mill. Organic/nutrient pollution was also evident in Silver Bow Creek below the Butte municipal wastewater outfall.

Since 1986, biological integrity has improved slightly at seven stations in the upper basin. Significant trends of improving biointegrity were evident in Silver Bow Creek, Warm Springs Creek, Blackfoot River, and in the Clark Fork River immediately downstream from confluences of Warm Springs Creek, the Little Blackfoot River and Rock Creek. Improved biointegrity over the past 10 years was primarily attributable to a slight, but widespread reduction in metals pollution. Trend analyses of metals-sensitive metrics scores indicated diminished metals pollution since 1986 in Silver Bow Creek above the Butte WWTP and below the Warm Springs Ponds, in Warm Springs Creek, and at eight Clark Fork River stations.

The greatest improvements in biointegrity occurred in Silver Bow Creek below the Warm Springs Ponds and in the Clark Fork River below Warm Springs Creek. Remediation activities at the Warm Springs Ponds and in the Mill-Willow creeks bypass channel coincided with improved biointegrity in this reach. The biological health of the upper Clark Fork River was enhanced by higher summer stream flows in 1993 and 1995. Since monitoring began in 1986, biological integrity was highest at all Clark Fork River stations from Deer Lodge to the confluence of the Bitterroot River in 1993. The highest biointegrity recorded in the Clark Fork River below Warm Springs Creek occurred in 1995. Biointegrity has been above the 10-year average at most stations since 1993.

In 1995, biointegrity was impaired at 17 of 25 monitoring stations. The Little Blackfoot River, Flint Creek, Rock Creek, Blackfoot River and Bitterroot River were nonimpaired in 1995. The Clark Fork at Turah, at Shuffield's, and above the Flathead River were the only nonimpaired mainstem stations in 1995. Blacktail Creek was moderately impaired by metals and nutrient/organic pollution. Metals pollution resulted in severe biological impairment in Silver Bow Creek from Butte to the Warm Springs Ponds. Slight impacts attributable to metals were detected in Silver Bow Creek below the Warm Springs Ponds, in Warm Springs Creek, and in the Clark Fork River from Warm Springs Creek to the Little Blackfoot River. The Clark Fork at Deer Lodge was moderately impaired by nutrient/organic pollution and metals pollution. Nutrient/organic and metals pollution caused slight biological impairment at the Clark Fork River station above the Little Blackfoot River. Nutrient/organic pollution was the principal cause of biological impairment in the Clark Fork River downstream from the Little Blackfoot River. Slight impacts attributable to nutrient pollution were detected in the Clark Fork River at Bearmouth, at Bonita, above Missoula, and from the Bitterroot River to Superior.

Longitudinal trends - Mean biointegrity (%) of stream reaches in the Clark Fork River Basin during August, 1986 through 1995. Metals and organic scores are based on metrics considered most sensitive to each type of pollution.



Stream reaches: SBC = Silver Bow Creek, CFR1 = Clark Fork River from Warm Springs Creek to the Little Blackfoot River, CFR2 = Clark Fork River from the Little Blackfoot River to Turah, CFR3 = Clark Fork River from the Blackfoot River to the Bitterroot River, CFR4 = the Clark Fork River from the Bitterroot River to Alberton, CFR5 = Clark Fork River from Alberton to the Flathead River.

Temporal trends -Mean biointegrity (%) in the Clark Fork River Basin during 10 years of monitoring (20 stations, 80 samples per year).

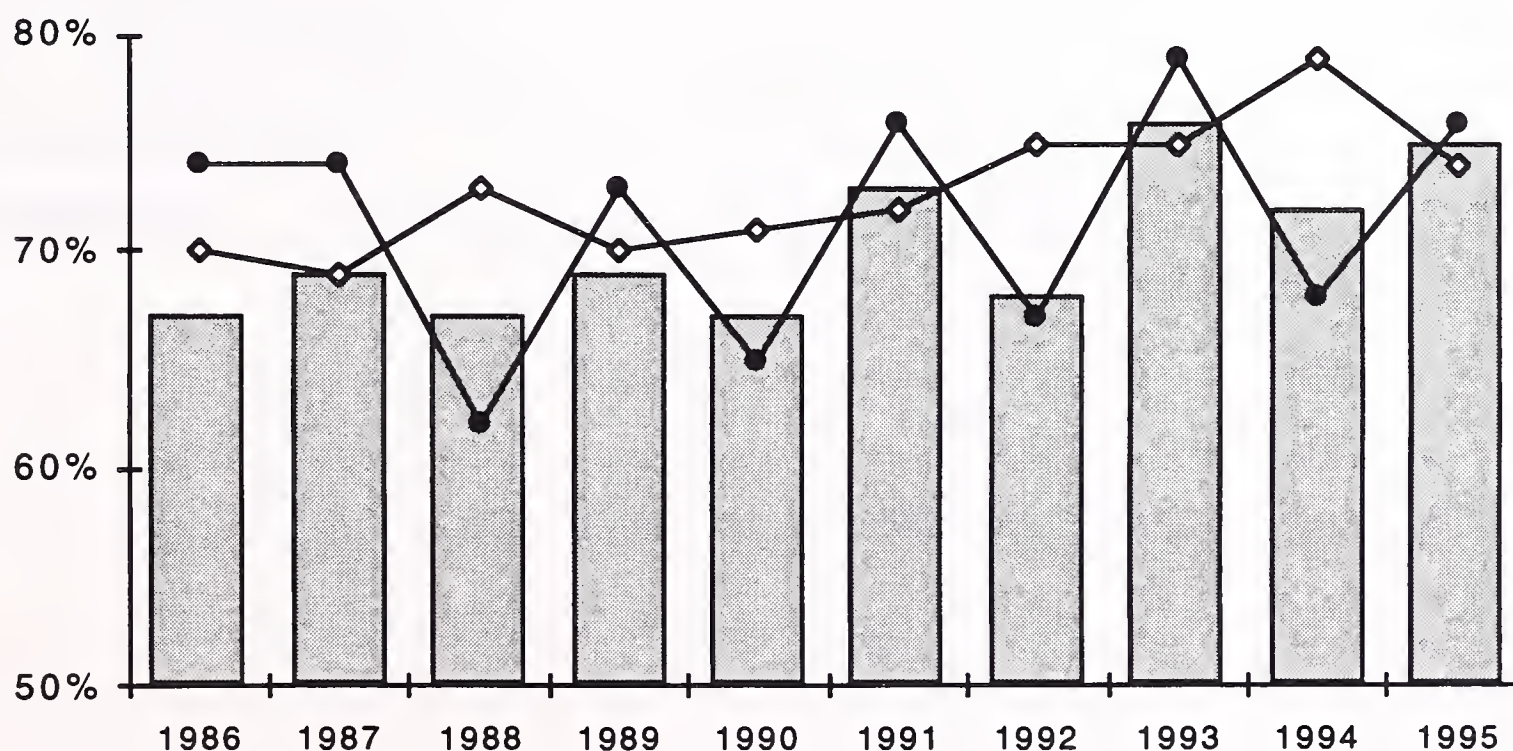


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1. INTRODUCTION

The Montana Department of Environmental Quality (DEQ) conducts annual macroinvertebrate surveys as part of a comprehensive environmental surveillance program of the Clark Fork River Basin. In 1986, the program expanded from a water quality study of the lower 230 miles of the Clark Fork River (Ingman 1985) into the headwaters of the Clark Fork Basin. Each August, macroinvertebrates have been collected at 25 stations along a 300-mile reach from Silver Bow Creek, in the headwaters, to Thompson Falls Reservoir on the lower Clark Fork River. This report documents the 10th year of monitoring in the upper Clark Fork River Basin.

Macroinvertebrates are good indicators of water quality and are commonly used to evaluate environmental impacts to streams. Healthy streams support diverse assemblages of mayflies (Ephemeroptera), stoneflies (Plecoptera), caddisflies (Trichoptera), true flies (Diptera), beetles (Coleoptera) and many others. These organisms provide energy pathways from primary producers (algae) and organic material to consumers (fish, humans, etc.). As integral components of stream ecosystems, macroinvertebrate assemblages reflect the cumulative impacts of all pollutants. Toxic substances, organic pollution and excessive sediment loading produce characteristic changes in the macroinvertebrate community. These responses can be used to document the type(s) and degree of pollution.

Macroinvertebrate-based assessments can be used to quantify ecosystem health or, its converse, environmental degradation. Biointegrity has been defined as "the capacity of supporting and maintaining a balanced, integrated, adaptive community having species composition diversity and functional organization comparable to that of natural habitat of the region" (Karr and Dudley 1981). This concept has

been refined to incorporate both ecological integrity and human values by Meyer (1997) who describes a healthy stream as "an ecosystem that is sustainable and resilient, maintaining its ecological structure and function over time while continuing to meet societal needs and expectations".

The analysis used in this report was specifically developed for the Clark Fork River Basin. Annual evaluations of aquatic ecosystem health are made at 25 sites and longitudinal and temporal trends are evaluated (McGuire 1987, 1989a, 1989b, 1993, 1995, McGuire and Ingman 1996). With the inclusion of the 1995 data, a 10-year data base exists for trend monitoring at 20 stations. The stations established in 1993 improve impact assessments for the upper basin and will eventually be incorporated into the temporal analyses.

2. STUDY AREA

The study area includes Silver Bow Creek, approximately 267 miles of the Clark Fork River and the lower reaches of eight tributaries (Figure 1). As in previous years, 25 stations were sampled in 1995 (Table 1). Sampling locations have remained unchanged since 1993 when seven sites were relocated. In 1993, five stations were dropped from the program (McGuire 1993) and stations were established on the Clark Fork at Bearmouth (station 11.7) and in the lower reaches of Blacktail Creek, the Little Blackfoot River, Flint Creek and Rock Creek (stations SF-1, 10.2, 11.5, and 12.5, respectively). Blacktail Creek is a head-water tributary to Silver Bow Creek while the other streams flow directly to the Clark Fork River. Due to construction in and around the Warm Springs Ponds, Silver Bow Creek stations 03 and 04 were replaced, respectively, by stations 02.5 and 04.5. Trend monitoring at these sites incorporates data from the original stations (1986-1992) and the replacement stations (1993-1995).

Figure 1
Clark Fork Basin
Monitoring Project



Table 1. Clark Fork Basin Project - 1995 macroinvertebrate stations.

station	name	reach	established
SF-1	Blacktail Creek above Grove Gulch		1993
00	Silver Bow Creek above Butte WWTP	SBC	1987
01	Silver Bow Creek below Colorado Tailings	SBC	1986
02.5 *	Silver Bow Creek at Opportunity	SBC	1993
04.5 *	Silver Bow Creek below Warm Springs Ponds		1993
06	Warm Springs Creek near mouth		1986
07	Clark Fork River below Warm Springs Creek	CF1	1986
09	Clark Fork River at Deer Lodge	CF1	1986
10	Clark Fork River above Little Blackfoot River	CF1	1986
10.2	Little Blackfoot River near mouth		1993
11	Clark Fork River at Gold Creek Bridge	CF2	1986
11.5	Flint Creek at New Chicago		1993
11.7	Clark Fork River at Bearmouth	CF2	1993
12	Clark Fork River at Bonita	CF2	1986
12.5	Rock Creek near Clinton		1993
13	Clark Fork River at Turah	CF2	1986
14	Blackfoot River near mouth		1986
15.5	Clark Fork River above Missoula	CF3	1986
18	Clark Fork River at Shuffield's	CF3	1986
19	Bitterroot River near mouth		1986
20	Clark Fork River at Harper Bridge	CF4	1986
22	Clark Fork River at Huson	CF4	1986
24	Clark Fork River at Superior	CF5	1986
25	Clark Fork River above Flathead River	CF5	1986
27	Clark Fork River above Thompson Falls Reservoir		1987

* station 02.5 replaced station 03, station 04.5 replaced station 04

3. METHODS

3.1 Field Work

Since 1986, WQD staff have collected benthic organisms with a modified Hess sampler (0.1 sq. meter diameter, 1000 micron mesh netting). During August of each year, four replicate samples were obtained from each station. Sampling methods are described in the WQD's Field Procedures Manual (1996). At each site, samples were obtained from the richest, most heterogeneous cobble habitats in riffles.

3.2 Laboratory Analysis

Laboratory processing was consistent with that used in previous years. Samples were rinsed in a U.S. Standard #30 sieve to remove the preservative. A small portion of the sample was placed in a white pan divided into ten equal areas by a grid. All macroinvertebrates were removed and sorted to order. This process was repeated until the entire sample was processed. If the sample clearly contained more than 1000 organisms, subsampling was used to estimate densities of selected abundant taxa (e.g. blackflies or hydropsychids). Samples were processed as usual except that selected taxa were removed from only two randomly selected grids. The number in the subsample was multiplied by five to provide estimated density per 0.1 m² Hess sample. Organisms were identified to the lowest level practical, usually genus or species, and enumerated.

3.3 Data Analysis

The analysis was specifically designed to evaluate environmental conditions in the Clark Fork River Basin (McGuire 1993). The analysis incorporates 10 metrics (Table 2) into a single index of biological integrity. The metrics used in the analysis exhibit predictable responses to environmental stress and were the most suitable to the broad range of

habitats within the study area. Each metric measured a different aspect of community composition, structure or function. Since biological communities integrate the effects of all environmental stresses, this analysis provided a reliable and sensitive evaluation of cumulative impacts from metals, nutrients, habitat degradation, and streamflow alteration.

To evaluate stream health, each metric was assigned a score (0 to 6) based on its comparability to a reference value. Scores for all metrics were totaled and the sum, expressed as a percentage of the maximum possible score, was used as an estimate of biological integrity. The resulting summary score provides an accurate and easily understandable estimate of ecological health.

Metric scoring criteria reflect the range of values in the Clark Fork River Basin from 1986 through 1990. Data from the first three years (1986-1988) of the Clark Fork River Basin study and two years of data (1988-1989) from the Blackfoot River were used to establish metric scoring criteria. For each metric, statistically significant differences among stations were identified by one-way analysis of variance (McGuire 1987, 1989a 1989b, 1990a, 1990b, Ingman et al. 1989, and unpublished data). Scoring criteria endpoints were defined by statistically distinct groups of stations with the highest and lowest scores. Nonimpaired endpoints were based on stations with the best metric scores and were generally established as the mean minus one standard deviation. On the lower end of the scale, endpoints were generally based on average values of the most severely impaired station(s).

Scoring criteria for some metrics were modified to improve the reliability and accuracy of the assessment. The lower end of the scoring criteria for taxa richness was truncated to provide better discrimination of slight impacts in the Clark Fork River at the expense of detecting slight improvements in Silver Bow Creek. Scoring criteria for percent filterers, Baetidae to Ephemeroptera, Hydropsychinae to Trichoptera,

and EPT to EPTC ratio metrics were relaxed to improve the reliability of these metrics over the wide range geographic area.

In general, biological integrity in the Clark Fork Basin can be categorized as nonimpaired (90 to 100%), slightly impaired (70 to 90%), moderately impaired (50 to 70%), or severely impaired (<50%). These impairment classifications were more conservative than statistical differences in the 1986 through 1988 Clark Fork River Basin data. Except for borderline values, scores in different narrative categories are considered significantly difference from one another.

Macroinvertebrates exhibit predictable responses to different types of environmental stress; consequently, the sensitivity of individual metrics varies with the type of pollution. Some parameters can be used as estimators of metals pollution while others are more sensitive to organic/nutrient enrichment, excessive sediment deposition or partial dewatering. Both metals and nutrient pollution are known to degrade water quality and impact aquatic life in the Clark Fork Basin (Ingman and Kerr 1990, McGuire 1990). Therefore, subsets of metrics considered sensitive to these forms of pollution were used to estimate the relative severity of each pollutant (Table 2).

Impacts attributable to metals and nutrient/organic pollutants were estimated by the sum of scores for metrics in each subset, expressed as a percentage of the maximum possible score (usually 18). Metrics comprising the nutrient/organic subset were community density, biotic index, and the percent relative abundance of filter-feeding macroinvertebrates. The subset used to estimate metals pollution consisted of community density, EPT richness and metals tolerance index.

A specific type of pollution was indicated when the score of one set of metrics was substantially lower than the other. To facilitate interpretation, impacts attributable to these pollutants were categorized as slight (~60 to 80%), moderate

(~40 to 60%) or severe (< 40%). The more conservative classification scheme for these metric subsets reflects the limitations of an assessment based on only three metrics. The impairment classifications accurately reflect statistical differences in the 1986 through 1988 Clark Fork River Basin data. Except for borderline values, scores in different narrative categories were considered significantly different from one another. Metrics and the rationale for their use are described below.

Macroinvertebrate Density

Total macroinvertebrate density is an important feature of community structure and, when carefully interpreted, can be a useful indicator of several different environmental conditions. Unusually high or low macroinvertebrate densities were considered indicative of environmental perturbation. Macroinvertebrate density tends to increase in response to organic and/or nutrient enrichment, and the magnitude of the increase reflects the magnitude of the pollution. Conversely, macroinvertebrate density may be reduced by toxic substances such as metals or by severe habitat degradation.

Low macroinvertebrate densities were used as an index of metals pollution in the upper Clark Fork River Basin. Specifically, this metric was included to document toxic impacts and to provide a measure of biological improvement in Silver Bow Creek. Historically, macroinvertebrates have been absent from or present at very low densities in Silver Bow Creek and the Mill-Willow Bypass (Spindler 1959, Multitech and OEA Research 1986, and McGuire 1990b). Increased macroinvertebrate abundance at these sites can be considered a clear indication of reduced toxicity. This metric provides little information regarding environmental health in the remainder of the study area.

High macroinvertebrate standing crops were included as a metric to assess nutrient and organic loading in the Clark Fork River. Densities greater than 2,000 per sample (0.1 m²) were attributed to organic pollution and/or enhanced primary production caused by nutrient enrichment. Given the threshold value of 2,000 organisms per sample, it is not considered a sensitive measure of organic loading to more oligotrophic tributaries. Because toxic conditions can preclude high macroinvertebrate densities (McGuire 1990b), this metric was not used to evaluate organic/nutrient pollution when density was less than 550 organism per sample. Densities between 550 and 2,000 organisms per sample received maximum scores for both metric

Taxa Richness

Taxa richness, or the number of macroinvertebrate taxa per Hess sample, was probably the single best measure of environmental condition in the Clark Fork River drainage. It is a reliable measure of biological integrity because the loss of the most sensitive species to any stress affects the index. The range for scoring this metric was 14 to 40 taxa per sample. This truncated scoring range maximizes the sensitivity of this metric to small reductions in taxa richness. Mean taxa richness in the lower Blackfoot River during 1988 and 1989 was 41 (Ingman et al 1990 and McGuire 1990a).

Shannon Diversity

Shannon diversity has long been used as an index of environmental condition (Weber 1973) and is a reliable measure of combined environmental stress in the Clark Fork drainage. This index has two components and is influenced by taxa richness and the distribution of individuals among taxa (evenness). Reference stations had an average Shannon diversity value of 3.7 with a standard deviation of 0.4. For this analysis, values greater than 3.3 were considered nonimpaired.

EPT to Chironomidae Ratio (EPT/EPTC)

This metric, originally developed by the EPA (Plafkin et al. 1989), is based on relative abundances of indicator groups. Most Ephemeroptera, Plecoptera, and Trichoptera are considered sensitive to environmental stresses while Chironomidae, as a group, are more tolerant. In the form $(E+P+T)$ divided by $(E+P+T+C)$, this metric ranges from 0 to 1.

An even distribution of individuals among the four groups reflects good biotic condition while a disproportionate number of chironomids indicates environmental stress. For the Clark Fork analysis, values <0.55 indicate impairment. Using this scale, the EPT/EPTC metric reliably identifies severe biological impairment but does not consistently separate slight, moderate and nonimpaired sites. In some cases, large populations of relatively tolerant EPT taxa (e.g. Baetidae, *Tricorythodes* or hydropsychids) result in high EPT/EPTC values. The % Baetidae of Ephemeroptera and % Hydropsychinae of Trichoptera metrics are included to identify slight to moderate impairment missed by the EPT/EPTC metric.

Percent Baetidae of Ephemeroptera

Members of the family Baetidae are among the most pollution-tolerant mayflies (Hubbard and Peters 1978). Slight to moderate environmental stress is indicated when baetids comprise a large proportion of the mayfly fauna. This metric ranges from 0 to 1 with high values (>0.85) indicating biological impairment. This metric received a default value of 1 when no mayflies were collected.

Percent Hydropsychinae of Trichoptera

The subfamily Hydropsychinae is, in general, more tolerant of pollution than most other caddisflies (Harris and Lawrence

1978). Environmental stress is indicated when most of the caddisflies in a sample are *Hydropsyche* and *Cheumatopsyche*. This metric is analogous to the Baetidae/Ephemeroptera metric and ranges from 0 to 1 with high values (>0.85) indicating biological impairment. When no caddisflies were collected, this metric received a default value of 1.

Biotic Index

The biotic index is based on the indicator organism approach to water quality assessment and was developed to measure organic pollution. The index is calculated: $\text{SUM } (\%RA_i * t_i)$, where $\%RA_i$ is the percent relative abundance of each taxon and t_i is the tolerance value of the taxon. This index is on a scale of 0 to 10 with higher values indicating more polluted conditions. Tolerance values used in this study (Appendix A) were taken from Hilsenhoff (1987) and McGuire (1992).

Percent Relative Abundance of Filter Feeders

The relative abundance of functional feeding groups can provide useful insights into energy transfer, food resources and organic loading in aquatic ecosystems. Filter feeding insects typically comprise a major component of the summer macroinvertebrate fauna in Montana rivers. Relative abundances greater than 50 percent indicate high seston (suspended organics) concentrations which are usually associated with organic/nutrient enrichment, extensive filamentous algae growth, or lake outflows. This metric is used as a measure of organic pollution in the Clark Fork River Basin. Functional classifications were based on Merritt and Cummins (1984).

EPT Richness

This metric summarizes species richness of Ephemeroptera, Plecoptera, and Trichoptera and was used as an indicator of

metals pollution. The majority of mayfly, stonefly and caddisfly species are highly sensitive to pollution. With a few exceptions, species in these groups are among the first to be eliminated by metals toxicity (Wiederholm 1984, Clements 1991). EPT richness averaged 21 among Blackfoot River reference stations. The wide scoring range minimized the influences of pollutants other than toxins on this metric.

Metal Tolerance Index (MTI)

This metric quantifies changes in community composition attributable to metals pollution in the Clark Fork River Basin. The format and calculation are based on Hilsenhoff's biotic index, with tolerance values assigned to each taxon based on sensitivity to metals rather than organics. The index is calculated: $\text{SUM } (\%RA_i * t_i)$, where $\%RA_i$ is the percent relative abundance of each taxon and t_i is the tolerance value of the taxon. The theoretical scale of the index is 0 to 10 with higher values indicating communities more tolerant of metals pollution. MTI values for communities dominated by species intolerant of metals are less than 4 (i.e. Blackfoot River) while values for communities comprised of only the most metals-tolerant species approach 10 (i.e. Silver Bow Creek).

Metals tolerance values (Appendix A) for most taxa were developed from the 1987 and 1988 Clark Fork River Basin water quality (Ingman and Kerr 1989) and macroinvertebrate (McGuire 1987 and 1989a) data. Ingman and Kerr (1989) quantified metals pollution severity for each station based on the frequency and magnitude of measured copper, zinc, cadmium, and lead concentrations exceeding EPA chronic or acute criteria for the protection of aquatic life. Stations were ranked by metals pollution severity (0.00 to 26.19). Macroinvertebrate taxa were ranked according to their relative abundance and distributions along this gradient. Abundant taxa (comprising at least five percent of the fauna at any station) were assigned a rank corresponding to the station where they attained their maximum relative

abundance. For less abundant taxa, ranks corresponded to the station at the midpoint of their distribution within the study area. Ranks were transformed to a scale of 0 to 10, rounded to the nearest integer, and used as metals tolerance values. Some tolerance values, particularly for infrequently collected taxa, were modified based on the author's interpretation of pertinent literature (Clements 1991, Clements et al. 1988, Rolin 1988, Wiederholm 1984, Winner et al. 1980, Yasuno et al. 1985, Lynch et al 1988, Leland et al 1989).

Stream Reaches

For some analyses, the study area was partitioned into six ecologically distinct stream reaches (McGuire 1989a). Reaches vary in length from approximately 10 to 70 miles and, since 1993, include two or four sampling stations (Table 1). These data were used to summarize environmental health in relatively homogeneous river reaches and to evaluate temporal and longitudinal trends using a scale of miles rather than individual sites.

Trend Analysis

Longitudinal and temporal trends in biological integrity within the Clark Fork River Basin were evaluated at several levels of resolution. Spearman rank correlation (Zar 1974) was used to identify temporal trends in biointegrity. Correlation coefficients (r_s) were calculated to identify temporal trends at individual stations, within stream reaches, and for the study area as a whole. For most stations, analyses were based on 40 samples obtained over 10 years. The fixed reference for all stations and years facilitated this trend analysis.

Table 2 . Metrics and criteria used to determine biological integrity in the Clark Fork River Basin.

Metric	Scoring Criteria					
	6	5	4	3	2	1 0
General						
Taxa richness	>39	39-35	34-30	29-25	24-20	19-15 <15
Shannon diversity	>3.3	3.3-3.0	2.9-2.6	2.5-2.2	2.1-1.8	1.7-1.4 <1.4
EPT/EPTC	>.54	.54-.45	.44-.35	.34-.25	.24-.15	.14-.05 <.05
Hydropsychinae/Trichoptera	<.85	.85-.87	.88-.90	.91-.93	.94-.96	.97-.99 1.00
Baetidae/Ephemeroptera	<.85	.85-.87	.88-.90	.91-.93	.94-.96	.97-.99 1.00
Organic pollution subset						
Density	550-1999	2000-2599	2600-3199	3200-3799	3800-4399	4400-4999 >5000
Biotic index	<4.0	4.0-4.5	4.6-5.1	5.2-5.7	5.8-6.3	6.4-6.9 >6.9
% Filterer	<51%	51-55%	56-60%	61-65%	66-70%	71-75% >75%
Metals pollution subset						
Density	>549	549-450	449-350	349-250	249-150	149-50 <50
EPT richness	>21	21-18	17-14	13-10	9-6	5-2 <2
Metals Tolerance Index	<4.0	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9 >8.9

all values are per 0.1 m2 Hess sample.

Each metric was scored from 0 (severe impact) to 6 (no impact).

Biointegrity was estimated as the sum of metric scores divided by the maximum possible score.

4. RESULTS AND DISCUSSION

Appendix A contains tolerance values for 191 macro-invertebrate taxa found in the study area since 1986. Identifications, organism counts, metric values and summary statistics for 1995 are presented in Appendix B. For each station, mean metric values, metric scores and percentage biointegrity assessments were calculated for each year that data were available (Appendix C).

4.1 Stream Discharge

Stream discharge was average to slightly above average throughout the basin during August, 1995. Mean August 1995 stream flows were generally 2 to 3 times those recorded in 1994 (Table 3).

4.2 Community Composition and Structure

Silver Bow Creek supported a simple benthic community characterized by low density, diversity, and taxa richness (Table 4). Pollution tolerant Chironomidae dominated in Silver Bow Creek above the Warm Springs Ponds (SBC). Mayflies, stoneflies and caddisflies were essentially absent from this reach. Hydropsychid caddisflies were numerically dominant below the Warm Springs Ponds.

Benthic assemblages were more complex, diverse, and species rich throughout the remainder of the study area. Taxa richness, EPT richness and diversity were slightly higher than average throughout the Clark Fork River (Table 4).

Hydropsychid caddisflies were numerically dominant throughout the Clark Fork mainstem; however, they were relatively less abundance than during low flow years. Dipterans, mayflies, beetles, stoneflies and other caddisflies were significant members of benthic assemblages.

4.3 1995 Overview

Significant environmental degradation was evident in most of the study area in 1995. On a broad scale, biological integrity was impaired in 5 of 6 stream reaches (Figure 2). Silver Bow Creek above the Warm Springs Ponds (SBC) was severely impaired while slight biological impairment was prevalent in Clark Fork River reaches from Warm Springs Creek to Huson (CFR1 through CFR4). The Clark Fork River from Superior to the confluence of the Flathead River (CFR5) was nonimpaired.

Biointegrity was impaired at 17 of 25 monitoring sites in 1995 (Figure 3). Bioassessment scores ranged from 25 to 98% (Table 5) and were categorized as nonimpaired (90 to 100%), slightly impaired (70 to 90%), moderately impaired (50 to 70%), or severely impaired (<50%). Among the 25 monitoring sites, eight were nonimpaired, eleven were slightly impaired, three were moderately impaired and three stations were severely impaired.

Moderate to severe impacts were restricted to the upper reaches of the Clark Fork River Basin. All three stations in Silver Bow Creek above the Warm Springs Ponds (stations 00, 01 and 02.5) were severely impaired. Biointegrity was moderately impaired in Silver Bow Creek below the Warm Springs Ponds (station 04.5), in Blacktail Creek (station SF-1) and in the Clark Fork River at Deer Lodge (station 09). Warm Springs Creek (station 06) and 10 Clark Fork River stations (Table 5) were slightly impaired.

Three Clark Fork River stations and five tributaries were considered nonimpaired in 1995. Clark Fork River stations at Turah (station 13), Shuffield's (Station 18) and above the Flathead River (station 25) were nonimpaired. Biological integrity was also greater than 90% in the lower reaches of the Little Blackfoot River, Flint Creek, Rock Creek, the Blackfoot River and the Bitterroot River (stations 10.2, 11.5, 12.5, 14 and 19, respectively).

4.3.1 Metals Pollution

In 1995, scores for metals-sensitive metrics ranged from 17 to 100% and indicated metals pollution at nine stations in the upper Clark Fork River Basin (Table 5). Metals-related impacts were not indicated in the Clark Fork River or its tributaries below the Little Blackfoot River.

Metals pollution was severe (Figure 3) at all sites in Silver Bow Creek above the Warm Springs Ponds (SBC: stations 00, 01 and 02.5). Scores for the metals-sensitive metric subset ranged from 17 to 28% at the three stations on upper Silver Bow Creek. All three metrics comprising this subset (community density, EPT richness and community metals tolerance) clearly indicated severe impacts in this reach (Table 4).

Slight metals-related impacts were indicated in Silver Bow Creek below the Warm Springs Ponds (station 04.5), Blacktail Creek (SF-1), Warm Springs Creek (station 06), and in the Clark Fork River from Warm Springs Creek to the Little Blackfoot River (CFR1: stations 07, 09 and 10). Elevated metals tolerance index values and diminished EPT richness indicated subtle metals-related impacts at these sites. Scores for the metals-sensitive metric subset ranged from 61 to 78% at these sites.

4.3.2 Nutrient/Organic Pollution

The macroinvertebrate bioassessment indicated widespread organic and/or nutrient pollution in the Clark Fork River during 1995 (Figures 2 and 3). Scores for the metrics most sensitive to these pollutants ranged from 50 to 100% and indicated biological impairment at 13 of 25 stations (Table 5).

Nutrient/organic pollution appeared to be the primary cause of reduced biological integrity during 1995 in Silver Bow Creek below the Warm Springs Ponds (station 04.5) and in the mainstem Clark Fork River. Moderate nutrient/organic pollution was detected in Silver Bow Creek below the Warm Springs Ponds and in the Clark Fork River at Deer Lodge (station 09). Slight impacts attributable to nutrient/organic pollutants were indicated at eight other Clark Fork River stations (Table 5) and at headwater stations in Blacktail Creek (SF-1) and in upper Silver Bow Creek (stations 00 and 01).

Impacts attributable to nutrient/organic pollution were not detected at five widely spaced mainstem stations (stations 07, 11, 13, 18, and 25) or in most tributaries (Figure 3). Nutrient/organic pollution was not indicated at stations on Warm Springs Creek, Little Blackfoot River, Flint Creek, Rock Creek, Blackfoot River or the Bitterroot River in 1995.

4.4 1995 and Long-term Site Specific Assessments

4.4.1 Clark Fork Basin Tributaries

Macroinvertebrate-based assessments provide an overview of relative conditions at 11 stations on eight Clark Fork River tributaries. At least three years of data were available for each site and most have been monitored since 1986 (Table 1).

The types and severity of pollutants varied substantially among streams (Figure 4). Excellent water quality was indicated in the Little Blackfoot River, Rock Creek and the Blackfoot River. In most years, Flint Creek and the Bitterroot River were slightly impaired by nutrient/organic pollution while Warm Springs Creek was slightly impaired by metals pollution. Blacktail Creek was moderately impaired by a combination of metals and nutrient/organic pollution. Silver Bow Creek above the Warm Springs Ponds (stations 00, 01 and 02.5) was severely polluted by metals while moderate metals pollution was evident below

the ponds (station 04.5). Slight to moderate nutrient/organic pollution was also indicated throughout Silver Bow Creek.

4.4.1.1 Blacktail Creek (station SF-1)

The station on Blacktail Creek above Grove Gulch was established in 1993. Biointegrity was 68% in 1995 and has ranged from 64 to 74% during the 3-year monitoring period. Slight to moderate impacts were indicated on all dates. Biological integrity was limited by the combined affects of poor habitat and water quality. Benthic habitat was limited due to sand scouring and embeddedness. Slight metals pollution was indicated all three years while nutrient/organic pollution was indicated in 1993 and 1995 (Figure 5). Nevertheless, this site was much healthier than stations in Silver Bow Creek.

4.4.1.2 Silver Bow Creek above the Butte WWTP (station 00)

Upper Silver Bow Creek was severely polluted by metals on all dates. In 1995, biointegrity was 27% and the metals subset score was 17%. While trends of decreased metals pollution and improved biointegrity have been documented since 1987 (Tables 6 and 7), actual improvement has been negligible at this station (Figure 6).

4.4.1.3 Silver Bow Creek below the Colorado Tailings (station 01)

Biointegrity remained severely depressed in Silver Bow Creek below the Colorado Tailing ant the Butte WWTP. In 1995, biointegrity was 25% and was similar to the 10 year average of 24%. Biological impairment was attributable to the combined impacts of severe metals pollution (28%), slight nutrient/organic pollution (67%) and poor habitat.

The severity of metals pollution in most years, including 1995, may have suppressed most biological responses to nutrient/organic pollution. More severe nutrient/organic pollution has been evident on some dates (Figure 7). Because

Silver Bow Creek provides minimal dilution of the Butte WWTP effluent, organic/nutrient pollution may continue to impair biological integrity at this site when, and if, metals pollution is sufficiently abated.

4.4.1.4 Silver Bow Creek at Opportunity (station 02.5)

In 1995, Silver Bow Creek at Opportunity was severely impaired by metals pollution. Biointegrity was estimated at 43% while scores for the organic and metals subsets were 92 and 22%, respectively. The 1995 metals score was the lowest recorded in this reach since 1990 (Figure 8).

Based on 1986 through 1994 data from stations 02.5 and 03 (Appendix C), significant temporal trends of improved biological integrity and diminished metals impacts were documented in this reach (McGuire 1996). However, neither trend was significant when the 1995 data were included in the analysis (Tables 6 and 7). This reach was classified as severely impaired each year except 1994 when biointegrity was moderately impaired. Biointegrity has averaged 44% during the past 10 years.

4.4.1.5 Silver Bow Creek below the Warm Springs Ponds (station 04.5)

Biointegrity at station 04.5 was moderately impaired (59%) in 1995. Based on 3 years of data, this site was slightly to moderately impaired (67%) by a combination of metals (68%) and nutrient/organic pollution (70%).

Concurrent with rehabilitation of the Warm Springs Ponds, this station was moved from the old pond outflow (station 04) to a new location (station 04.5) in 1993. The new site was further from the ponds and, unlike the old site, downstream from the confluence of Mill and Willow Creeks. Biointegrity was significantly higher at the new station than at the old site (Figure 9). Biointegrity was severely impaired in Silver Bow

Creek below the ponds from 1986 to 1991, but improved to slightly or moderately impaired in 1993 and 1994.

The Warm Springs treatment pond greatly reduced the severity of metals pollution in Silver Bow Creek. Biological integrity was significantly higher (ANOVA, $P = 0.01$) in Silver Bow Creek below the ponds than at upstream stations.

4.4.1.6 Warm Springs Creek (station 06)

Biological integrity in Warm Springs Creek was slightly impaired by metals pollution in 1995. This finding was consistent with long-term monitoring results. However, metals impacts have diminished and biointegrity has increased during the past 10 years. Only slight metals pollution has been detected since 1991 and biointegrity was nonimpaired in 1991 and 1994 (Figure 10). Low stream flow precluded quantitative sampling in 1992. Nutrient/organic pollution was not indicated in Warm Springs Creek.

4.4.1.7 Little Blackfoot River (station 10.2)

Biological integrity has been nonimpaired in the Little Blackfoot River during all three years of monitoring. Mean biointegrity was 94%, indicating excellent water quality (Figure 11).

4.4.1.8 Flint Creek (station 11.5)

Flint Creek at New Chicago was nonimpaired in 1995. Biointegrity was estimated at 92%. During the previous two years, this site was slightly impaired by nonpoint source nutrient and sediment pollution (Figure 12). From 1993 to 1995, mean biointegrity was 84%. The nutrient/organic metric subset averaged 76%. Metals pollution was not indicated.

4.4.1.9 Rock Creek near Clinton (station 12.5)

Biological integrity was nonimpaired in the Rock Creek on all three dates sampled (Figure 13). Mean biointegrity was 92%, indicating excellent water quality.

4.4.1.10 Blackfoot River near mouth (station 14)

The site on the lower Blackfoot River was among the healthiest stations in the study area. Biointegrity has averaged 89% over the last 10 years and has been rated as nonimpaired since 1990 (Figure 14). Slight impairment was detected in 1986, 1987 and 1989. This stress has diminished as biological integrity has increased in the lower Blackfoot River since 1986.

4.4.1.11 Bitterroot River near mouth (station 19)

The lower Bitterroot River was nonimpaired in 1995. However, nutrient/organic pollution was indicated during eight of the last 10 years (Figure 15). Impacts generally have been slight, and were not detected during relatively high stream flow years (1993 and 1995).

4.4.2 Clark Fork River

The current biomonitoring program includes 14 station on the Clark Fork River (Table 1). Data from three additional mainstem stations were collected prior to 1993 (McGuire 1993).

The Clark Fork River was relatively healthy in 1995. Biointegrity estimates were slightly higher than the 10-year average at 12 stations (Figure 16). The Clark Fork at Deer Lodge (station 09) was the only station classified as moderately impaired in 1995 and the only site where biointegrity was below the long-term average.

Biological integrity has exhibited a fairly consistent pattern in the Clark Fork River since 1986. Nutrient/organic pollution was widespread but usually caused only slight biological impacts. Metals pollution was occasionally detected as far downstream as Missoula; however, in most years, impacts have been slight and confined the river reach above the confluence of the Little Blackfoot River.

4.4.2.1 Clark Fork River below Warm Springs Creek (station 07)

The uppermost station on the Clark Fork River was slightly impaired by metals pollution in 1995. Biointegrity was estimated at 88%, the highest score recorded at this site since monitoring began in 1986 (Table 6). Significant trends of increasing biological integrity and decreasing metals and nutrient/organic pollution occurred at this site. Biointegrity was moderately impaired from 1986 through 1992, but has been only slightly impaired since 1993. Biointegrity was significantly higher (ANOVA, $P = 0.01$) from 1993 through 1995 than in all previous years (Figure 17).

4.4.2.2 Clark Fork River at Deer Lodge (station 09)

The Clark Fork River at Deer Lodge was moderately impaired in 1995. Biointegrity was estimated at 58% due to moderate nutrient/organic pollution (50%) and slight metals pollution (72%). This site was classified as moderately impaired during 8 of the last 10 years and, with the exception of Silver Bow Creek, had the lowest mean biointegrity (65%) in the study area. Both nutrient/organic and metals pollution were consistently indicated at this site. On most dates, nutrient/organic pollution appeared to have the greater impact on biointegrity (Figure 18).

4.4.2.3 Clark Fork River above Little Blackfoot River (station 10)

The Clark Fork River above the Little Blackfoot River was slightly impaired by nutrient/organic and metals pollution in 1995. The biointegrity estimate for 1995 (74%) was similar to the 10 year average (72%). Slight metals and nutrient/organic pollution were both routinely indicated at this site (Figure 19).

4.4.2.4 Clark Fork River at Gold Creek Bridge (station 11)

Biological integrity was slightly impaired (86%) at the Gold Creek Bridge in 1995. However, neither nutrient/organic nor metals pollution have been clearly indicated at this site since 1992 (Figure 20). Biointegrity averaged 85% over the past 10 years and was nonimpaired in 1993 and 1994.

4.4.2.5 Clark Fork River at Bearmouth (station 11.7)

Biointegrity estimates have ranged from nonimpaired (94%) to moderately impaired (67%) since this station was established in 1993. Biointegrity (73%) was slightly impaired by nutrient-organic pollution in 1995. Nutrient pollution was also clearly indicated in 1994 (Figure 21). Significant metals pollution was not indicated at this site.

4.4.2.6 Clark Fork River at Bonita (station 12)

Nutrient/organic pollution caused slight biological impairment at this site in 1995 and on most other dates. The biointegrity estimate for 1995 (74%) was slightly higher than the long-term average (70%). The Clark Fork at Bonita was slightly to moderately impaired by nutrient/organic and metals pollution from 1986 through 1992. While nutrient pollution remains evident, metals pollution has not been indicated since 1992 (Figure 22).

4.4.2.7 Clark Fork River at Turah (station 13)

The Clark Fork at Turah has been nonimpaired since 1993 and was among the healthiest stations in the study area. Biointegrity was estimated at 94% in 1995 and, since 1986, has averaged 87%. During the past 10 years, biointegrity has increased slightly as nutrient and metals pollution diminished. Slight metals pollution was indicated at this site in 1986 and 1990 while nutrient/organic pollution was indicated in 1987, 1988, 1990 and 1992 (Figure 23).

4.4.2.8 Clark Fork River above Missoula (station 15.5)

This site, located approximately 1.5 miles below Milltown Dam, was slightly impaired by nutrient/organic pollution in 1995. Biointegrity was slightly higher in 1995 (83%) than the 7-year average (80%). Slight to moderate nutrient/organic pollution was usually evident at this site (Figure 24). Slight metals pollution was indicated at this site in 1989 and 1990.

4.4.2.9 Clark Fork River at Shuffield's (station 18)

The Clark Fork at Shuffield's was nonimpaired in 1995. Biointegrity was higher in 1995 (94%) than the 10-year average (86%). Slight nutrient/organic pollution was sometimes indicated (Figure 25) at this site which is approximately two miles below the Missoula WWTP discharge. Metals pollution has not been indicated at this site since monitoring began in 1986.

4.4.2.10 Clark Fork River at Harper Bridge (station 20)

This site had the lowest mean biointegrity (74%) among stations from Missoula to the Flathead River. Biointegrity was slightly impaired (82%) in 1995. Nutrient/organic pollution has been indicated at Harper Bridge throughout the 10-year monitoring period. Impacts have generally been slight, although moderate impacts were indicated in 1988 and 1993 (Figure 26). Impacts

appear to result from the assimilation of nutrients from the Missoula WWTP and the Bitterroot River.

4.4.2.11 Clark Fork River at Huson (station 22)

Biointegrity was slightly impaired (79%) in the Clark Fork River at Huson in 1995. Biointegrity has averaged 77% with nutrient/organic pollution evident throughout the monitoring period (Figure 27). Biointegrity was moderately impaired in 1986, 1988 and 1994 and slightly impaired on all other dates.

4.4.2.12 Clark fork River near Superior (station 24)

This was one of the healthiest sites on the Clark Fork River. Biointegrity was estimated at 89% in 1995, and has averaged 84% during the past 10 years. Slight nutrient/organic pollution was indicated from 1987 through 1990 and in 1994 (Figure 28).

4.4.2.13 Clark Fork River above the Flathead River (station 25)

The Clark Fork River above the confluence of the Flathead River remains healthy. The biointegrity estimate for 1995 (98%) was the highest recorded in the study area during 10 years of monitoring. Since 1986, biointegrity has averaged 84% at this site. Slight nutrient/organic pollution was indicated from 1988 through 1990 and in 1993 and 1994 (Figure 29).

4.4.2.14 Clark Fork River above Thompson Falls Reservoir (station 27)

Biointegrity scores have been consistently low at this site, averaging 69%, during 9 years of monitoring (Figure 30). Biointegrity was estimated at 72% at this site in 1995.

This is the only monitoring station downstream from the confluence of the Flathead River. The river was much larger

(Table 3) and the environment was much different than in upstream sites. The relatively small substrate, depositional habitat and daily water level fluctuations contributed to the uniqueness of this site. Not surprisingly, the benthic fauna was quite different at this site than elsewhere in the basin. The macroinvertebrates inhabiting this site appeared to be those of a large, relatively pollution-free river. The relatively low bioassessment scores may have been due to sampling limitations rather than poor water quality. The Hess sampler was limited to shallow, near-shore areas that probably did not represent optimal habitat for this reach.

4.5. Trend Monitoring

Longitudinal and temporal trends in biological integrity within the Clark Fork River Basin were evaluated at several levels of resolution.

4.5.1 Longitudinal Trends

Longitudinal trends have been consistent since monitoring began in 1986. Among stream reaches (Summary Figure 2), biological integrity was lowest in Silver Bow Creek (SBC) and improved with distance downstream to the confluence of the Bitterroot River. Biointegrity was severely impaired in Silver Bow Creek and was significantly ($P = 0.01$) lower than in the Clark Fork River. The upper reach of the Clark Fork River (CFR1) was moderately impaired while downstream reaches of the Clark Fork River (CFR2 through 5) were slightly impaired. Biointegrity was slightly lower in the Clark Fork River from the confluence of the Bitterroot River to Alberton (CFR4) than in adjacent Clark Fork River reaches.

Long-term data from 17 mainstem stations provided a more detailed picture of longitudinal trends (Figure 16). Pollution was severe, and biointegrity was consistently lowest, at the two upstream stations in Silver Bow Creek (00 and 01). Biological integrity generally improved with distance downstream from

these sites in lower Silver Bow Creek (stations 02.5 and 04.5) and the upper Clark Fork River.

From 1986 to 1993, biointegrity was generally lowest in the Clark Fork mainstem at the upstream station (07) and increased in a downstream direction as far as the Gold Creek Bridge (station 11). However, since 1994, biointegrity has been substantially lower at Deer Lodge (station 09) than at the upstream station. This shift resulted from a significant improvement in biointegrity at station 07 since 1993 (Figure 17).

Based on 10-year means, biointegrity was slightly impaired at all mainstem stations below the confluence of the Little Blackfoot River (Figure 31). Among mainstem stations, biological integrity was usually highest at the Gold Creek Bridge, Turah, Shuffield's, Superior and above the Flathead River (stations 11, 13, 18, 24, and 25, respectively). Biointegrity tended to be lower from Bearmouth to Bonita (stations 11.7 and 12) and from Harper Bridge to Alberton below Missoula (stations 20 and 22) than at adjacent stations.

4.5.2 Temporal trends

Since 1986, biointegrity has generally increased at monitoring stations in the Clark Fork Basin. Correlation coefficients (r_s) were positive for all 20 long-term stations, all six stream reaches, and the study area as a whole (Table 6). Trends were significant ($P = 0.05$) for seven sites in the upper basin. During the past 10 years, biological integrity has improved at two stations in Silver Bow Creek (00 and 04.5), in lower Warm Springs Creek (station 06), the lower Blackfoot River (station 14) and in the Clark Fork River below Warm Springs Creek, at Gold Creek Bridge and at Turah (stations 07, 11, and 13, respectively).

Improved biointegrity at these stations was primarily attributable to a slight, but widespread reduction in metals pollution during the past 10 years (Table 7). For the study area (20 long-term monitoring stations), mean scores for metals-sensitive metrics ranged from 69% in 1987 to 79% in 1994 and exhibited a significant positive trend. Trend analyses of scores for metals-sensitive metrics indicated diminished metals pollution at 11 stations (Table 7). The actual change in scores over time was small in all cases.

Fewer trends were identified among scores for nutrient and organic-sensitive metrics. Trends indicating reduced nutrient/organic pollution were detected in Silver Bow Creek below the Warm Springs Ponds (station 04.5) and in the Clark Fork River below Warm Springs Creek (station 07) and at Turah (station 13).

Table 3. Mean streamflows during August at selected USGS gaging stations in the Clark Fork River Basin (cubic feet per second).

year	Silver Bow Creek blw Blacktail Cr. USGS # 12323250	Clark Fork River at Deer Lodge USGS # 12324200	Clark Fork River below Missoula USGS # 12353000	Clark Fork River near Plains USGS # 12389000
1986	19.5	55.7	1812	7612
1987	27.7	88.5	1473	9813
1988	18.7	27.8	997	5656
1989	22.0	81.7	2464	14750
1990	25.8	84.3	2554	10510
1991	16.4	30.1	1997	10350
1992	14.2	40.1	1280	9738
1993	28.7	312	3696	11770
1994	16.1	36.3	1295	5891
1995	21.8	107	2561	10360
mean	21.1	86	2013	9645
high and low flows in bold				

Table 4. Mean metric values characterizing macroInvertebrate assemblages in six reaches of the Clark Fork River Basin during August, 1986 through 1995 (ranges in parentheses).

metric	SBC		CFR1		CFR2		CFR3		CFR4		CFR5	
	1986-1994	1995	1986-1994	1995	1986-1994	1995	1986-1994	1995	1986-1994	1995	1986-1994	1995
Density	498 (88-1103)	477	1726 (650-2769)	2431	1892 (581-4704)	1325	935 (616-1692)	2041	2039 (839-3733)	1821	1136 (393-2418)	878
Taxa richness	10 (7-12)	10	27 (24-32)	32	34 (26-40)	38	34 (28-41)	45	32 (28-40)	36	33 (28-42)	39
EPT richness	2 (1-3)	1	13 (10-14)	15	18 (14-21)	20	19 (16-22)	25	17 (16-20)	18	18 (16-23)	22
S. Diversity	1.8 (1.5-2.1)	2.0	2.6 (2.1-3.8)	3.1	3.2 (3.0-4.0)	3.5	3.4 (3.0-4.0)	3.7	3.0 (2.7-3.7)	3.0	3.5 (3.1-3.8)	3.7
EPT/EPTC	0.17 (.10-.26)	0.06	0.88 (.74-.96)	0.67	0.79 (.73-.84)	0.76	0.82 (.78-.90)	0.74	0.75 (.52-.93)	0.73	0.71 (.60-.82)	0.77
Baetidae/Ephem.	0.94 (.67-1.00)	1.00	0.80 (.54-.97)	0.71	0.59 (.29-.77)	0.61	0.67 (.45-.91)	0.59	0.69 (.51-.90)	0.45	0.46 (.21-.69)	0.19
Hydropsychinae/Trich.	0.94 (.72-.99)	0.87	0.89 (.71-.99)	0.87	0.81 (.63-.96)	0.85	0.87 (.81-.95)	0.88	0.91 (.82-.98)	0.89	0.90 (.72-.97)	0.77
% Filterer	36 (8-53)	7	61 (32-73)	51	51 (29-61)	55	60 (36-73)	51	64 (48-73)	67	60 (52-69)	55
Biotic Index	5.6 (5.4-6.1)	5.3	4.9 (4.7-5.2)	5.3	4.8 (4.4-5.3)	4.9	4.5 (4.2-4.9)	4.7	4.9 (4.6-5.4)	4.8	4.8 (4.5-5.0)	4.3
Metals Index	8.2 (7.6-8.9)	8.8	5.1 (4.7-5.2)	5.6	4.8 (4.2-5.3)	5.0	4.5 (4.0-4.8)	4.8	4.9 (4.6-5.4)	4.8	4.2 (3.5-4.7)	3.6

Stream reaches: SBC = stations 00, 01 & 02.5, CF1 = stations 07, 09 & 10, CF2 = stations 11, 12 & 13, CF3 = stations 15.5 & 18, CF4 = stations 20 & 22, CF5 = stations 24 & 25.
1994 values in bold were outside established ranges.

Table 5. Macroinvertebrate community biointegrity estimates for Clark Fork River Basin stations during August, 1995.

Station	% B i o i n t e g r i t y		
	overall	metals subset	organic subset
SF-1	68 **	72 *	78 *
00	27 ***	17 ***	75 *
01	25 ***	28 ***	67 *
02.5	43 ***	22 ***	92
04.5	59 **	61 *	56 **
06	75 *	67 *	92
07	88 *	78 *	83
09	58 **	72 *	50 **
10	74 *	78 *	67 *
10.2	97	94	94
11	86 *	83	83
11.5	92	89	89
11.7	73 *	83	61 *
12	74 *	83	67 *
12.5	93	83	100
13	94	89	89
14	97	94	100
15.5	83 *	94	67 *
18	94	89	89
19	98	100	94
20	82 *	89	67 *
22	79 *	83	67 *
24	89 *	94	78 *
25	98	100	94
27	72 *	67 *	50 **
Reach means			
SBC	32 ***	22 ***	78 *
CFR1	73 *	76 *	67 *
CFR2	82 *	85	75 *
CFR3	89 *	92	78 *
CFR4	81 *	86	67 *
CFR5	94	97	86
ALL	77 *	77 *	78 *

Classification : slightly impaired *, moderately impaired **, severely impaired ***.

Table 6. Mean macroinvertebrate biointegrity (%) and Spearman rank correlation coefficients (rs) for long-term Clark Fork River Basin monitoring stations - August, 1986-95.

station	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean	rs	P value
00		18	32	15	22	35	17	22	35	27	25	.42	.01
01	38	17	32	13	26	25	20	20	21	25	24	.15	.34
02.5 *	38	40	35	50	43	43	43	47	55	43	44	.25	.13
04.5 **	45	44	44	47	41	45		71	70	59	52	.57	.00
06	67	78	80	82	78	91		77	91	75	80	.40	.02
07	59	64	53	59	55	65	65	83	82	88	67	.70	.00
09	52	65	62	73	61	83	55	86	53	58	65	.08	.63
10	52	68	71	80	79	86	68	87	59	74	72	.28	.09
11	86	80	85	88	63	89	85	92	94	86	85	.33	.04
12	64	80	58	76	61	64	56	89	76	74	70	.24	.15
13	88	80	76	88	86	92	83	95	89	94	87	.49	.00
14	82	83	90	85	92	88	89	90	95	97	89	.79	.00
15.5	76	88	86	77	68	79	80	90	82	83	81	.25	.15
18	73	88	91	80	86	91	83	95	80	94	86	.27	.10
19	79	83	82	91	85	86	79	90	73	98	85	.22	.18
20	71	77	61	79	73	79	76	61	79	82	74	.19	.23
22	62	86	68	89	88	71	74	85	68	79	77	.12	.45
24	90	79	76	73	88	85	92	91	74	89	84	.11	.49
25	83	85	82	76	80	83	88	80	82	98	84	.22	.17
27		65	68	64	67	72	67	67	78	72	69	.15	.37
Mean	67	68	67	69	67	73	68	76	72	75	70	.75	.01
Reach means ***													
SBC		25	33	26	30	34	27	30	37	32	31	.19	.35
CFR1	54	66	62	71	65	78	63	85	65	73	68	.39	.04
CFR2	79	80	73	84	70	82	75	92	86	85	81	.34	.07
CFR3	75	88	89	79	77	85	82	93	81	89	84	.28	.22
CFR4	67	82	65	84	81	75	75	73	74	81	75	.17	.46
CFR5	87	82	79	75	84	84	90	86	78	94	84	.27	.25

* data for station 03: 1986-1992, station 02.5: 1993-1995.

** data for station 04:1986-1992, station 04.5: 1993-1995.

*** Stream reaches: SBC = stations 00, 01 & 02.5, CF1 = stations 07, 09 & 10, CF2 = stations 11, 11.7,12 & 13, CF3 = stations 15.5 & 18, CF4 = stations 20 & 22, CF5 = stations 24 & 25.

Table 7. Macroinvertebrate biointegrity (%) as measured by metrics* sensitive to metals pollution and Spearman rank correlation coefficients (rs) for long-term Clark Fork River Basin stations - August, 1986-95.

station	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean	rs	P value
00		0	0	11	22	17	11	11	39	17	14	.63	.00
01	39	6	44	33	44	33	28	44	44	28	34	.09	.57
02.5	22	17	44	28	22	28	50	33	56	22	32	.26	.10
04.5	61	61	61	67	67	61		72	72	61	65	.39	.02
06	50	56	67	72	67	83		72	83	67	69	.68	.00
07	72	72	78	72	72	72	72	83	83	78	75	.64	.00
09	78	78	72	83	72	83	72	78	72	72	76	-.24	.14
10	72	78	72	67	78	83	78	78	78	78	76	.44	.00
11	83	78	78	89	67	83	78	89	94	83	82	.37	.02
12	78	83	78	78	72	78	78	83	83	83	79	.12	.48
13	78	89	94	83	78	89	94	94	89	89	88	.45	.00
14	61	83	83	67	83	72	100	83	94	94	82	.55	.00
15.5	83	92	92	72	78	83	83	83	89	94	85	.37	.03
18	83	89	89	83	89	89	94	94	94	89	89	.28	.08
19	83	89	89	94	83	89	89	78	83	100	88	-.06	.70
20	83	83	78	78	78	83	83	89	83	89	83	.33	.04
22	83	89	83	89	78	83	83	83	83	83	84	-.23	.15
24	89	83	89	83	94	83	94	94	83	94	89	.04	.82
25	67	89	94	83	89	83	89	94	94	100	88	.55	.00
27		72	78	72	78	78	78	67	78	67	74	-.27	.12
mean	70	69	73	70	71	73	75	75	79	74	73	.84	.00
Reach means													
SBC		8	29	24	29	26	30	29	46	22	27	.31	.11
CFR1	74	76	74	74	74	79	74	80	78	76	76	.33	.07
CFR2	80	83	83	83	72	83	83	89	89	85	83	.34	.07
CFR3	83	91	91	78	84	86	89	89	92	92	87	.36	.12
CFR4	83	86	81	84	78	83	83	86	83	86	83	.19	.42
CFR5	78	86	92	83	92	83	92	94	89	97	88	.52	.02

* metric subset: metals tolerance index, EPT richness and community density.

** data for station 03: 1986-1992, station 02.5: 1993-1995.

*** data for station 04:1986-1992, station 04.5: 1993-1995.

Table 8. Macroinvertebrate biointegrity (%) as measured by metrics* sensitive to organic pollution and Spearman rank correlation coefficients (rs) for long-term Clark Fork River Basin stations - August, 1986-95.

station	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean	rs	P value
00		83	83	58	75	83	67	83	83	75	77	.11	.54
01	67	67	67	17	50	58	42	28	33	67	50	-.04	.83
02.5 **	83	83	33	100	83	75	42	92	61	92	74	-.01	.94
04.5 **	50	56	44	39	39	56		83	72	56	55	.44	.01
06	100	92	75	94	83	94		92	94	92	91	-.08	.64
07	72	72	50	78	56	72	83	83	83	83	73	.54	.00
09	56	67	50	61	44	83	50	89	50	50	60	-.03	.83
10	39	61	56	83	67	89	67	83	50	67	66	.23	.16
11	89	72	92	89	42	89	78	94	89	83	82	-.09	.57
12	72	83	33	67	61	50	44	89	72	67	64	-.04	.81
13	89	67	44	89	83	83	67	92	89	89	79	.35	.03
14	100	83	83	100	100	100	94	92	92	100	94	.31	.06
15.5	72	75	81	58	42	78	83	100	78	67	73	.30	.09
18	67	89	94	78	72	89	61	89	61	89	79	-.08	.62
19	72	72	72	83	72	78	67	92	56	94	76	.20	.23
20	67	67	39	78	67	72	61	33	67	67	62	-.06	.71
22	61	78	50	89	92	61	61	78	33	67	67	.01	.96
24	83	72	61	61	78	83	89	89	61	78	76	.06	.70
25	92	83	72	72	72	83	83	61	72	94	78	-.05	.74
27		42	56	56	33	50	61	42	67	50	51	.02	.93
Mean	74	73	62	73	66	76	67	79	68	76	72	.29	.42
Reach means													
SBC		78	61	58	69	72	50	68	59	78	67	-.01	.96
CFR1	56	67	52	74	56	81	67	85	61	67	66	.25	.18
CFR2	83	74	56	82	62	74	63	92	83	80	75	.16	.40
CFR3	70	82	88	68	57	84	72	95	70	78	76	.09	.71
CFR4	64	73	45	84	80	67	61	56	50	67	64	-.13	.58
CFR5	88	78	67	67	75	83	86	75	67	86	77	-.04	.87

* metric subset: biotic index, % filterers and community density.

** data for station 03: 1986-1992, station 02.5: 1993-1995.

*** data for station 04:1986-1992, station 04.5: 1993-1995.

Figure 2. Mean biointegrity in Clark Fork River Basin reaches during 1995.

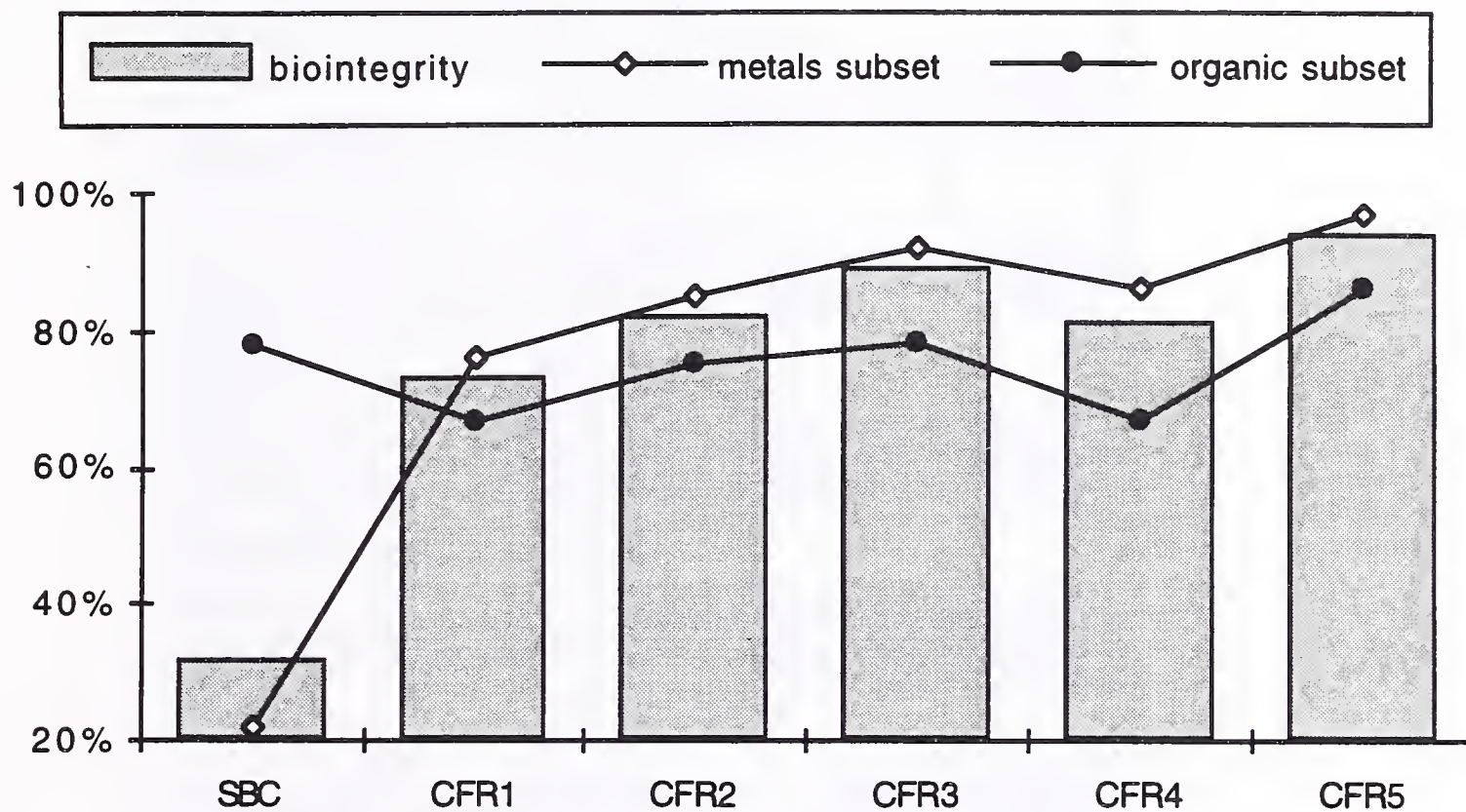


Figure 3. Benthic community biointegrity at 25 stations in the Clark Fork River Basin during August, 1995.

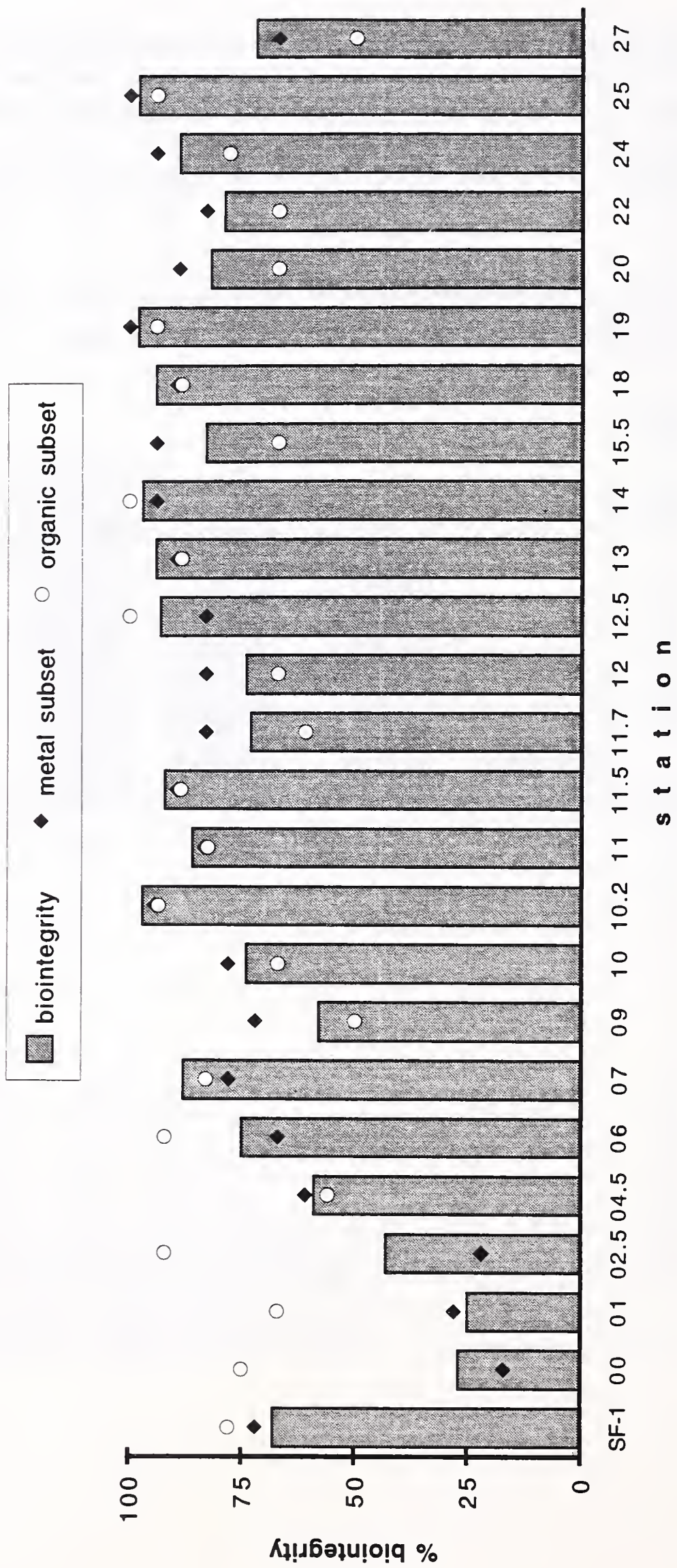


Figure 4. Long-term mean benthic community biointegrity in selected Clark Fork River tributaries (Silver Bow Creek, Warm Springs Creek, Blackfoot River, and Bitterroot River: 1986-1995; all others: 1993-1995).

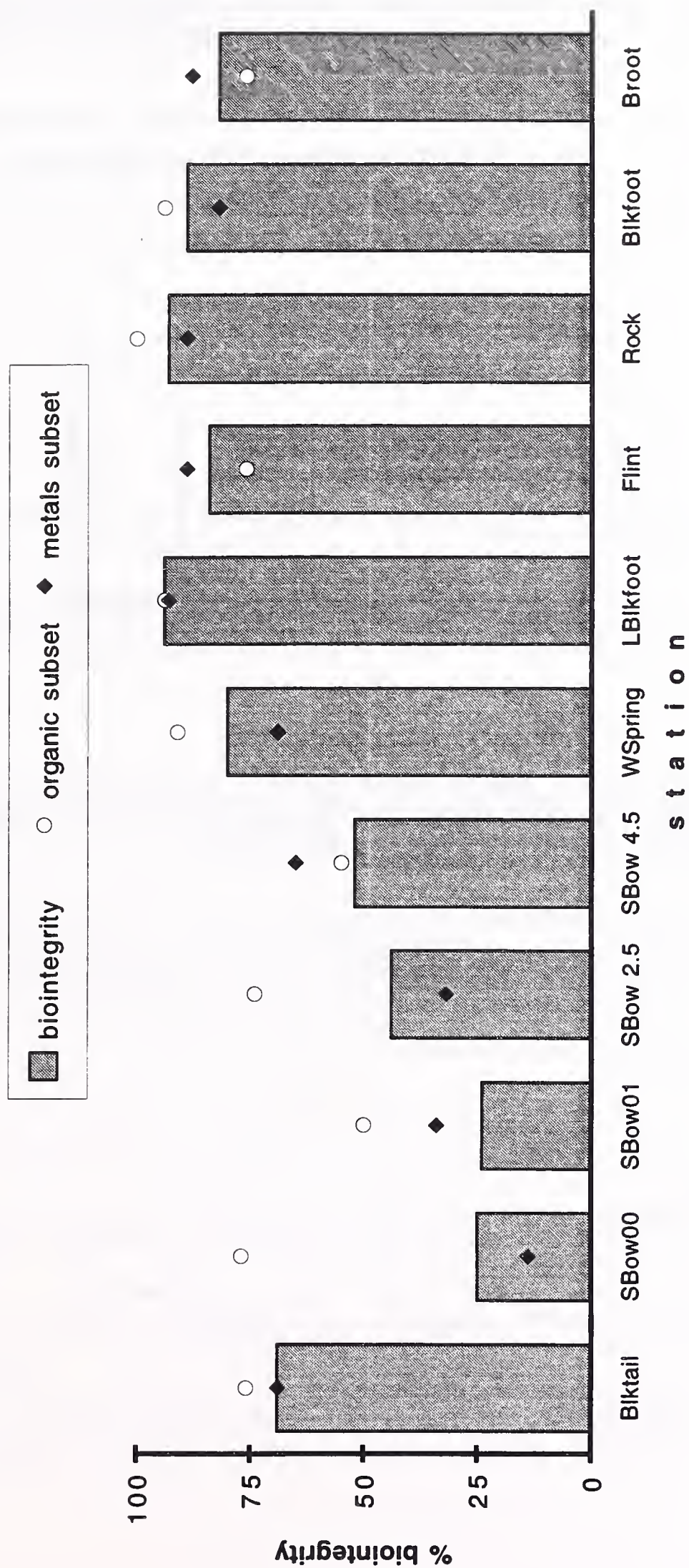


Figure 5. Biointegrity (%) in Blacktail Creek above Grove Gulch (station SF-1), 1993-1995.

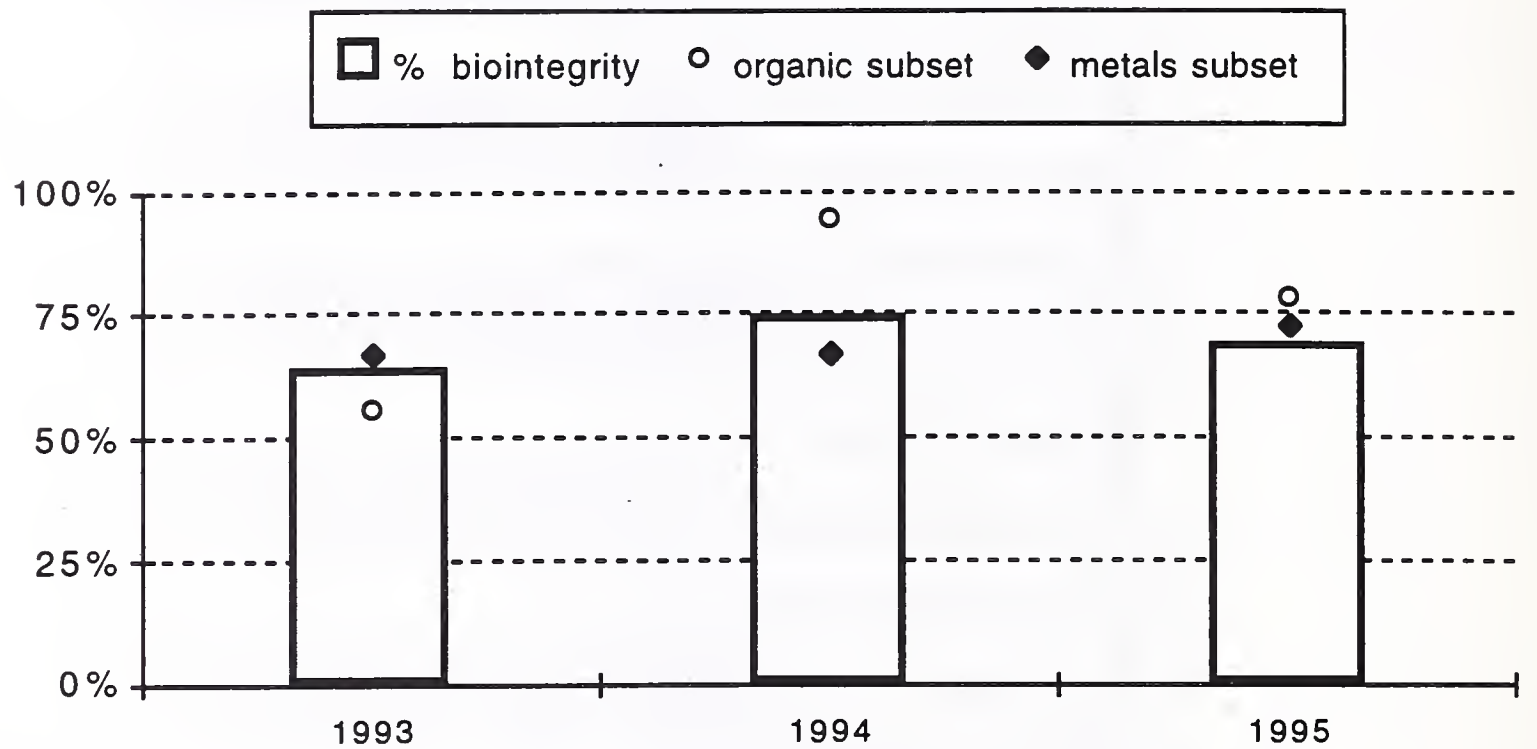


Figure 6. Biointegrity (%) in Silver Bow Creek above the Butte WWTP (station 00), 1987-1995.

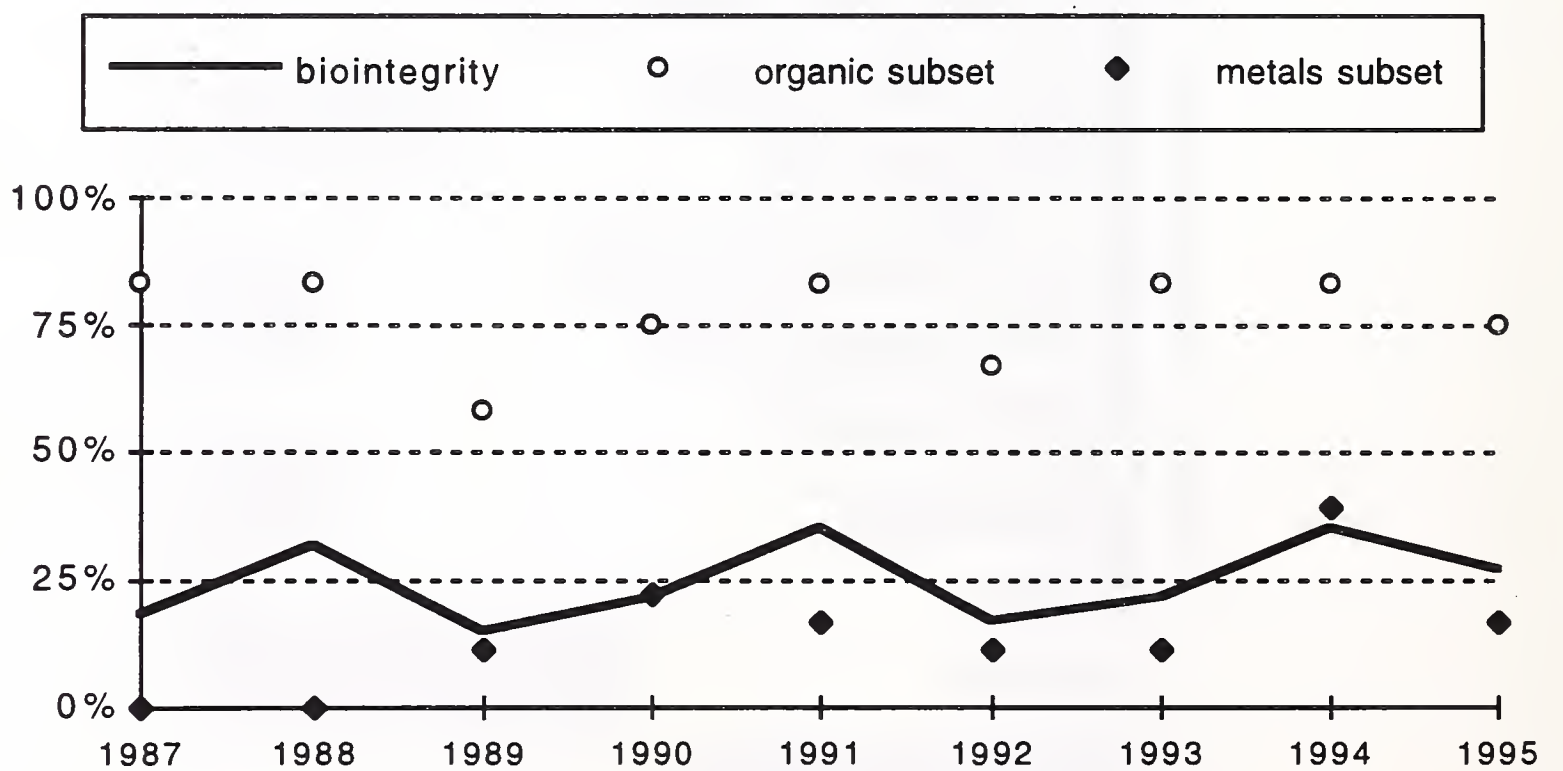


Figure 7. Biointegrity (%) in Silver Bow Creek below the Colorado Tailings (station 01), 1986-1995.

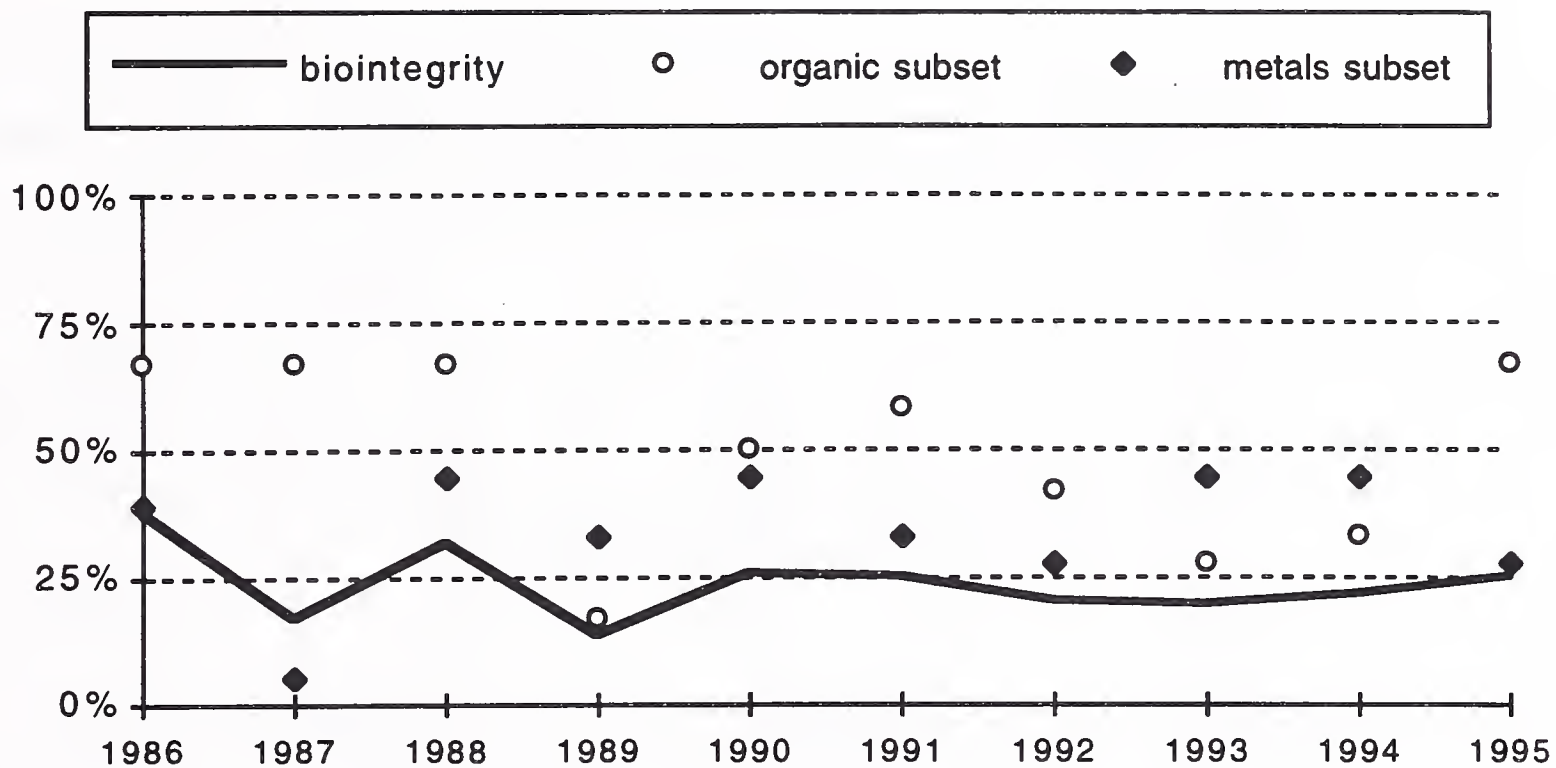


Figure 8. Biointegrity (%) in Silver Bow Creek near Opportunity (station 02.5, 1993-1995; station 03, 1986-1992).

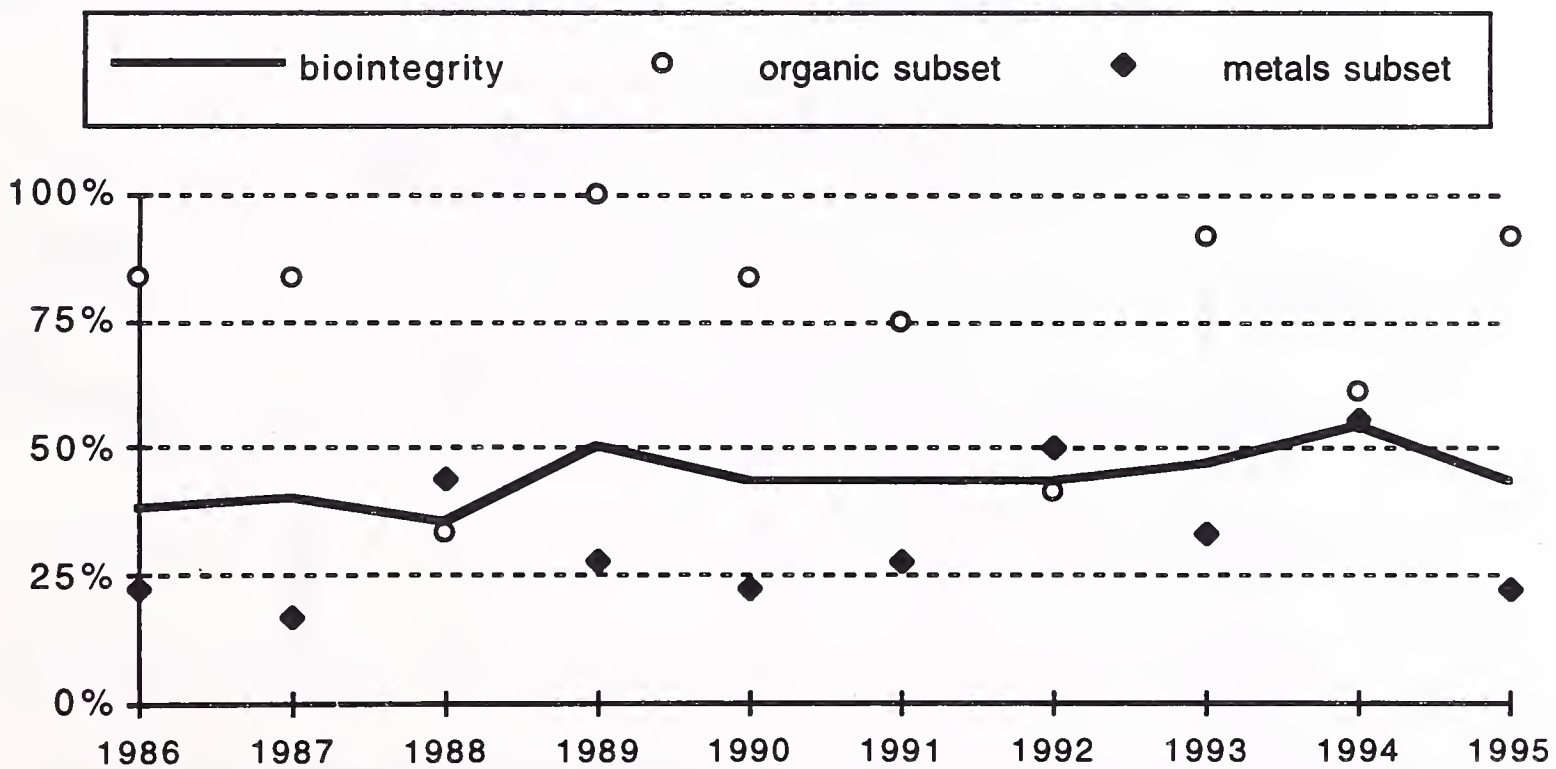


Figure 9. Biointegrity (%) in Silver Bow Creek below the Warm Springs Ponds (station 04, 1986-1991; station 04.5, 1993-1995).

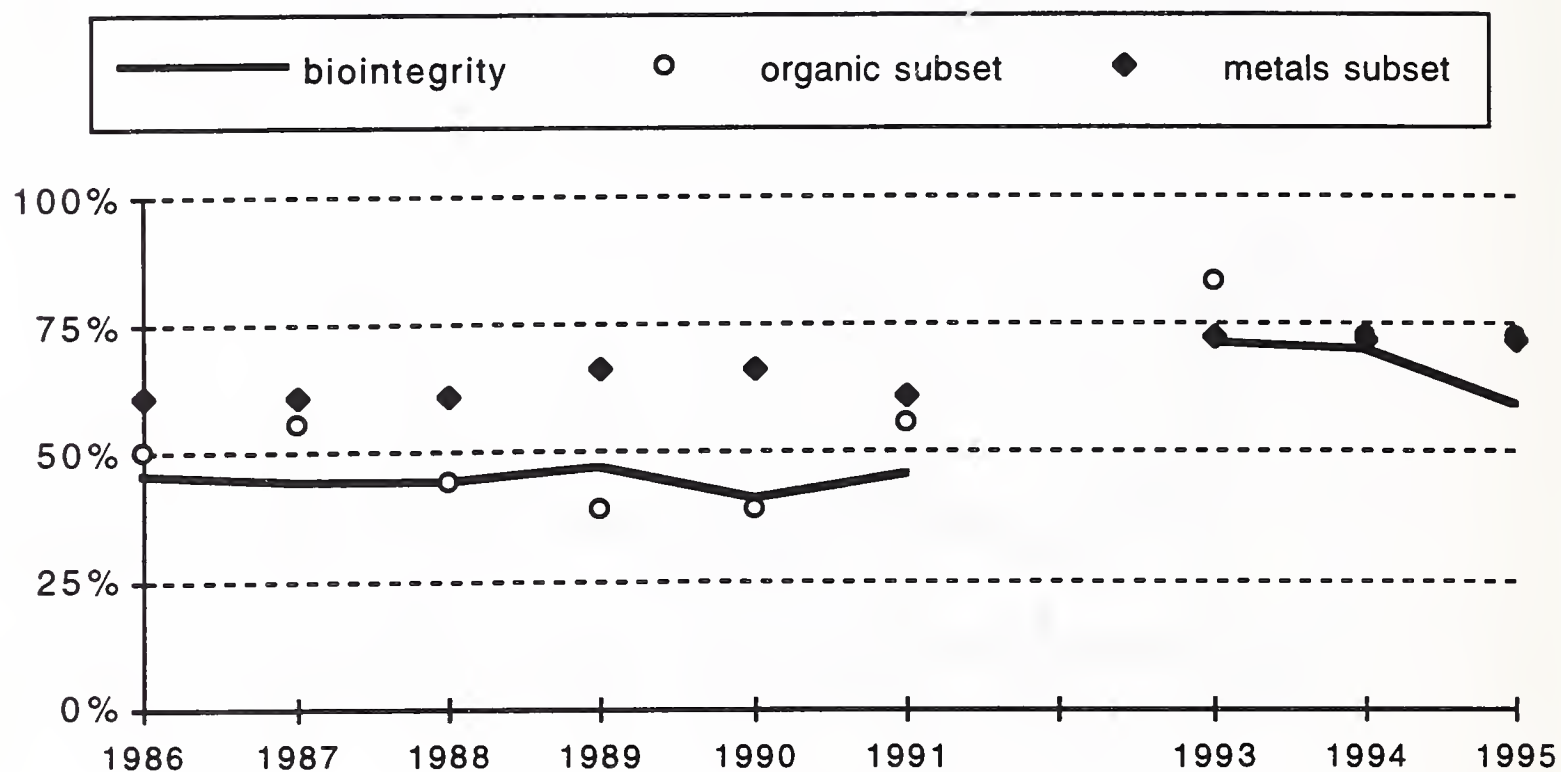


Figure 10. Biointegrity (%) in Warm Springs Creek near mouth (station 06, 1986-1995).

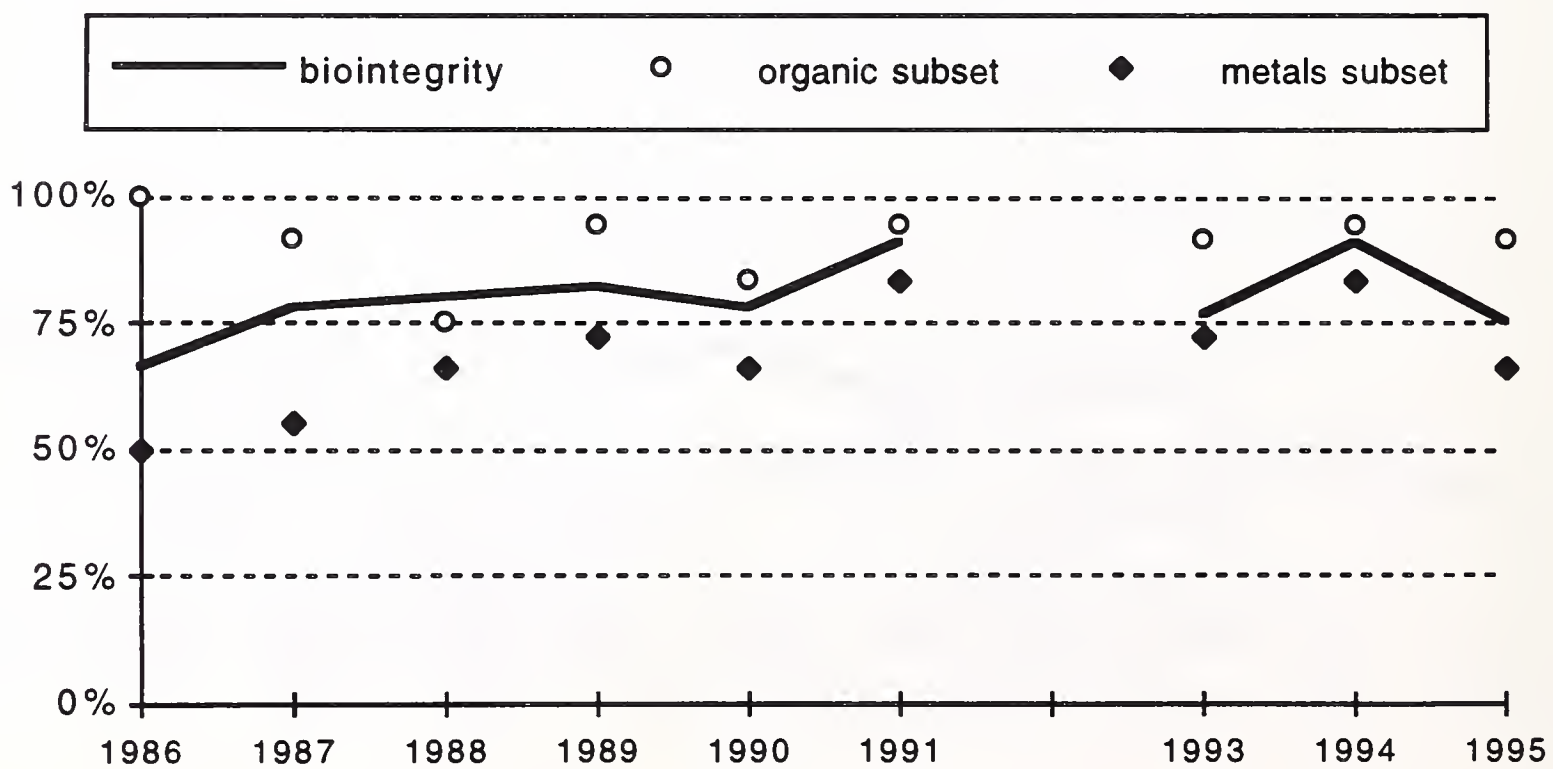


Figure 11. Biointegrity (%) in the Little Blackfoot River near mouth (station 10.2), 1993-1995.

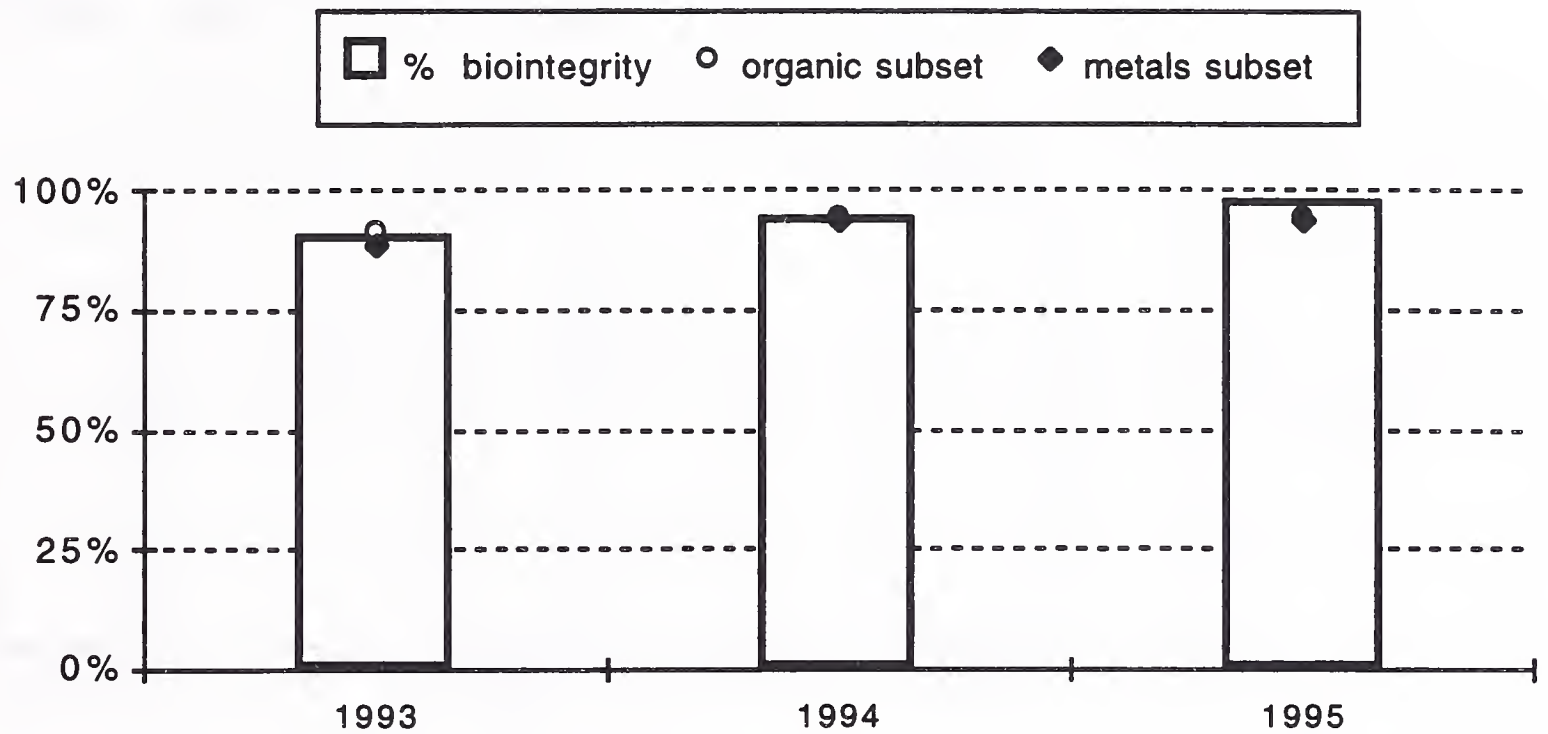


Figure 12. Biointegrity (%) in Flint Creek at New Chicago (station 11.5), 1993-1995.

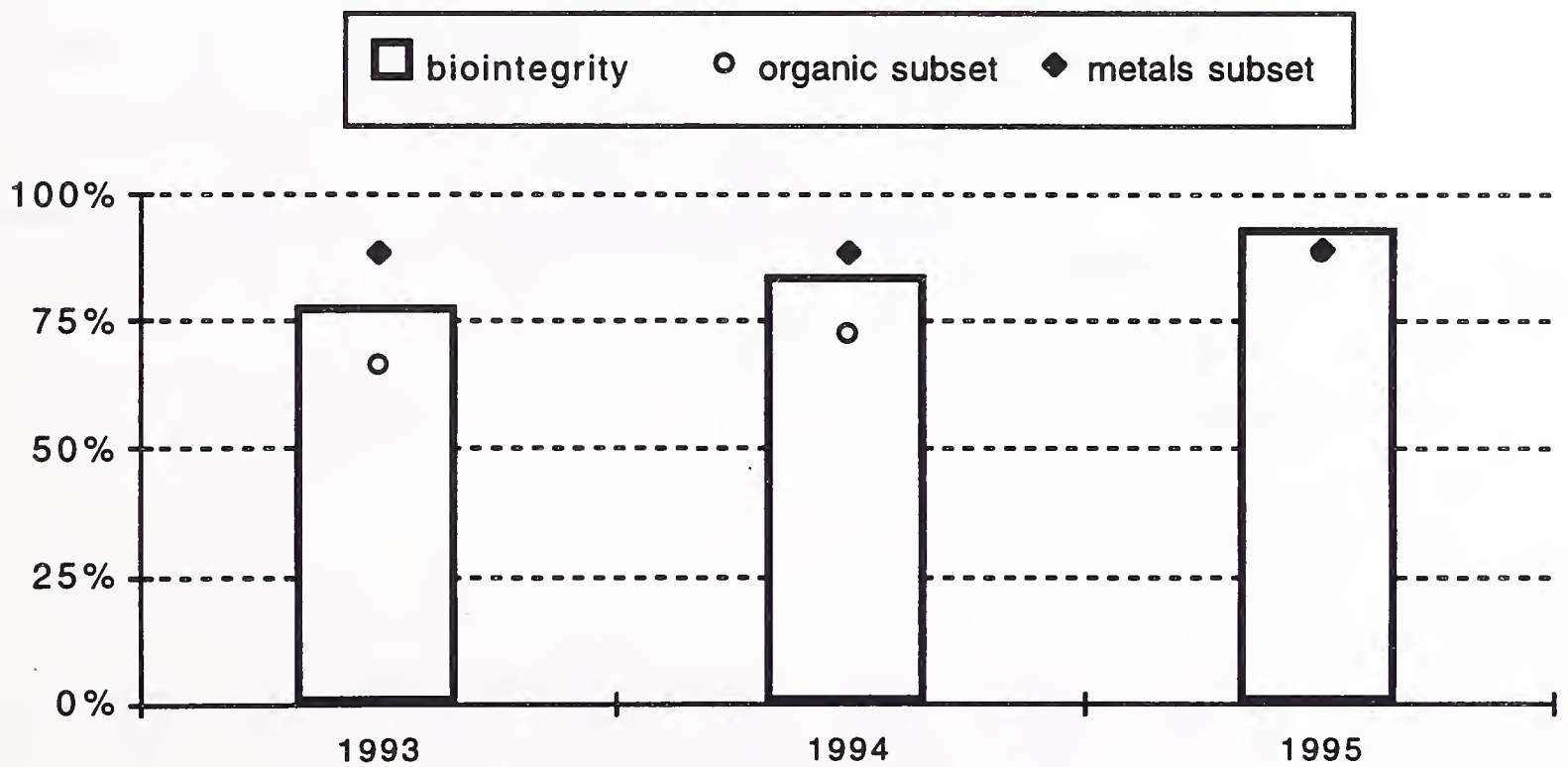


Figure 13. Biointegrity (%) in Rock Creek near mouth (station 12.5), 1993-1995.

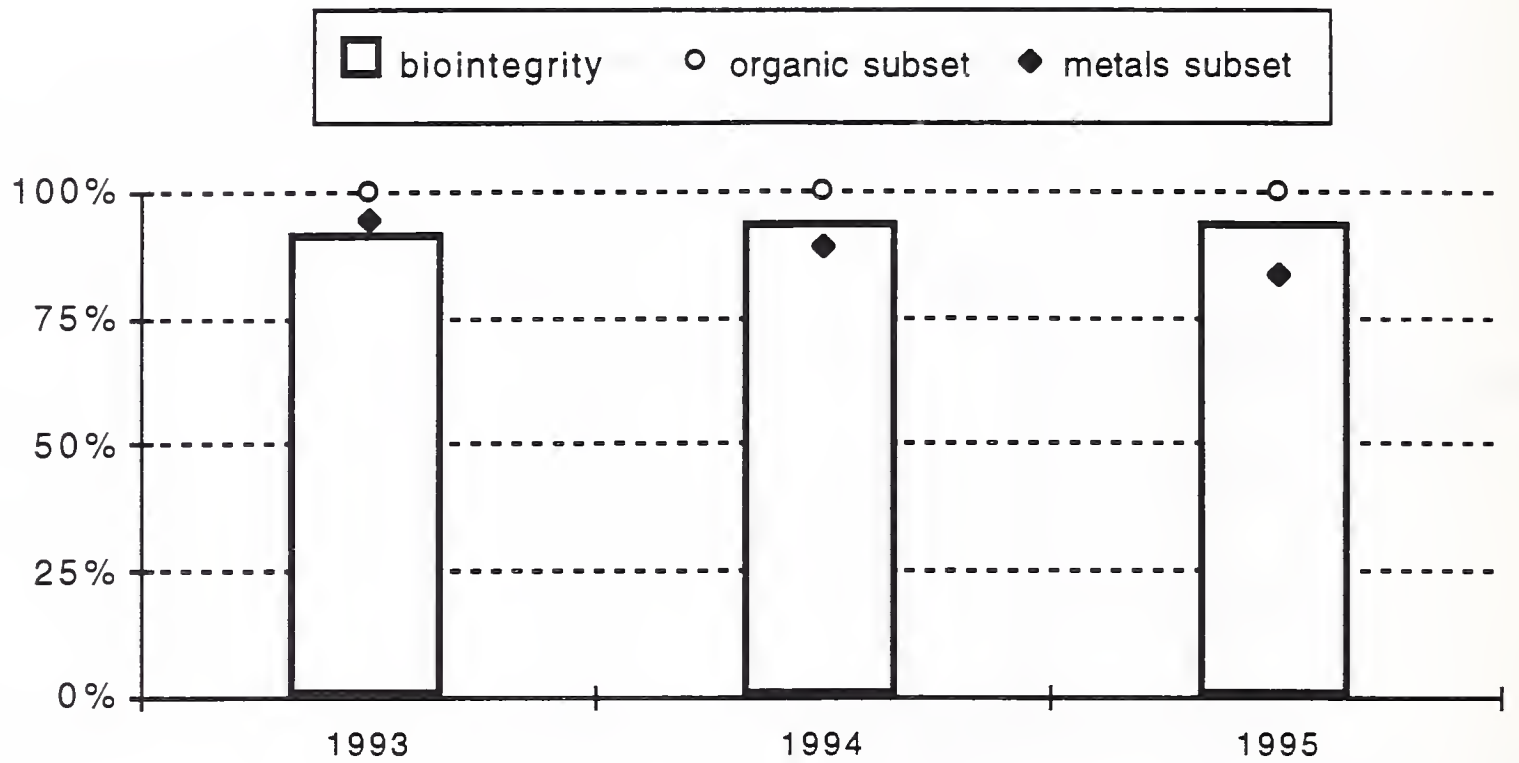


Figure 14. Biointegrity (%) in the Blackfoot River near mouth (station 14), 1986-1995.

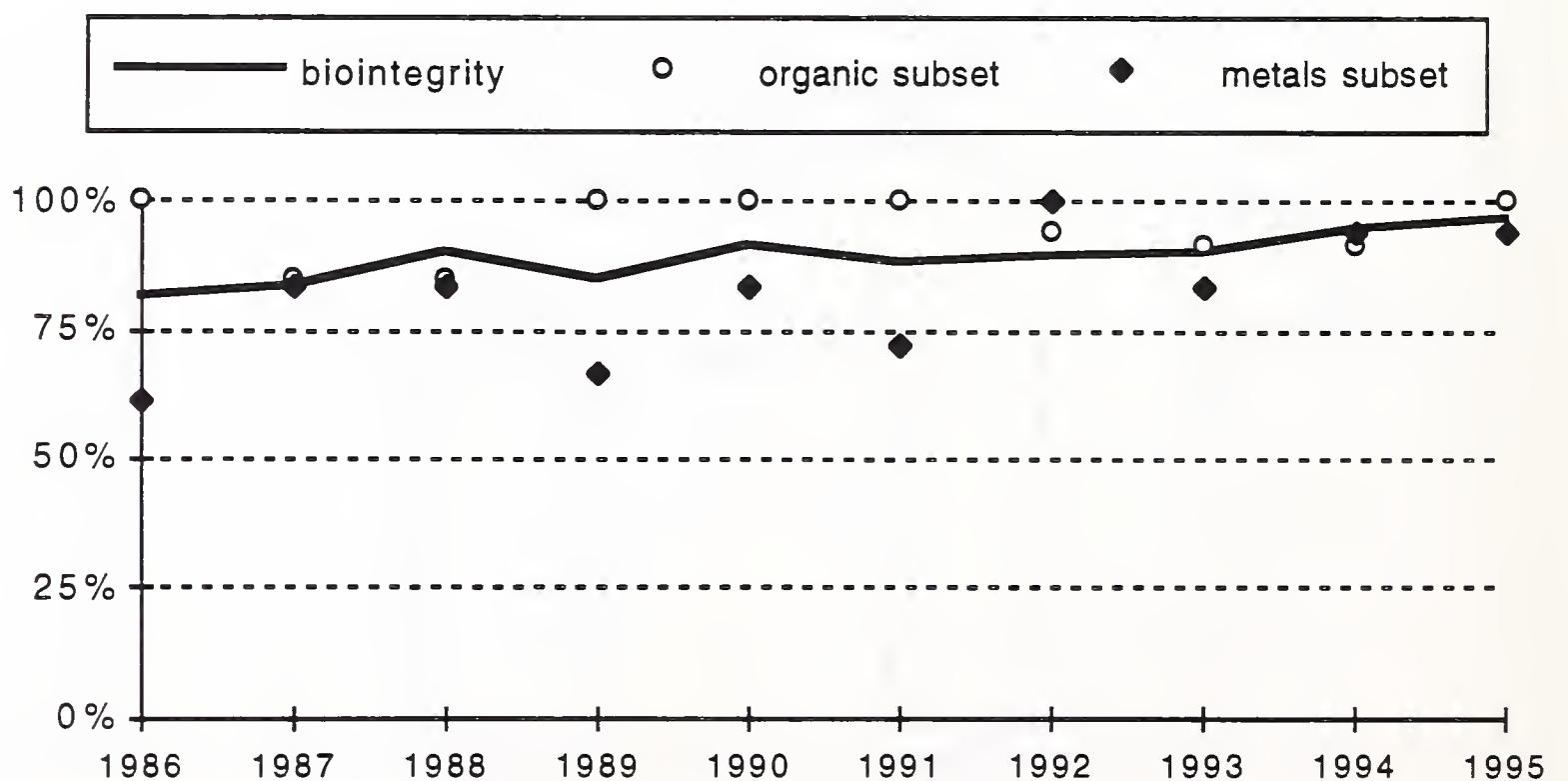


Figure 15. Biointegrity (%) in the Bitterroot River near mouth (station 19), 1986-1995.

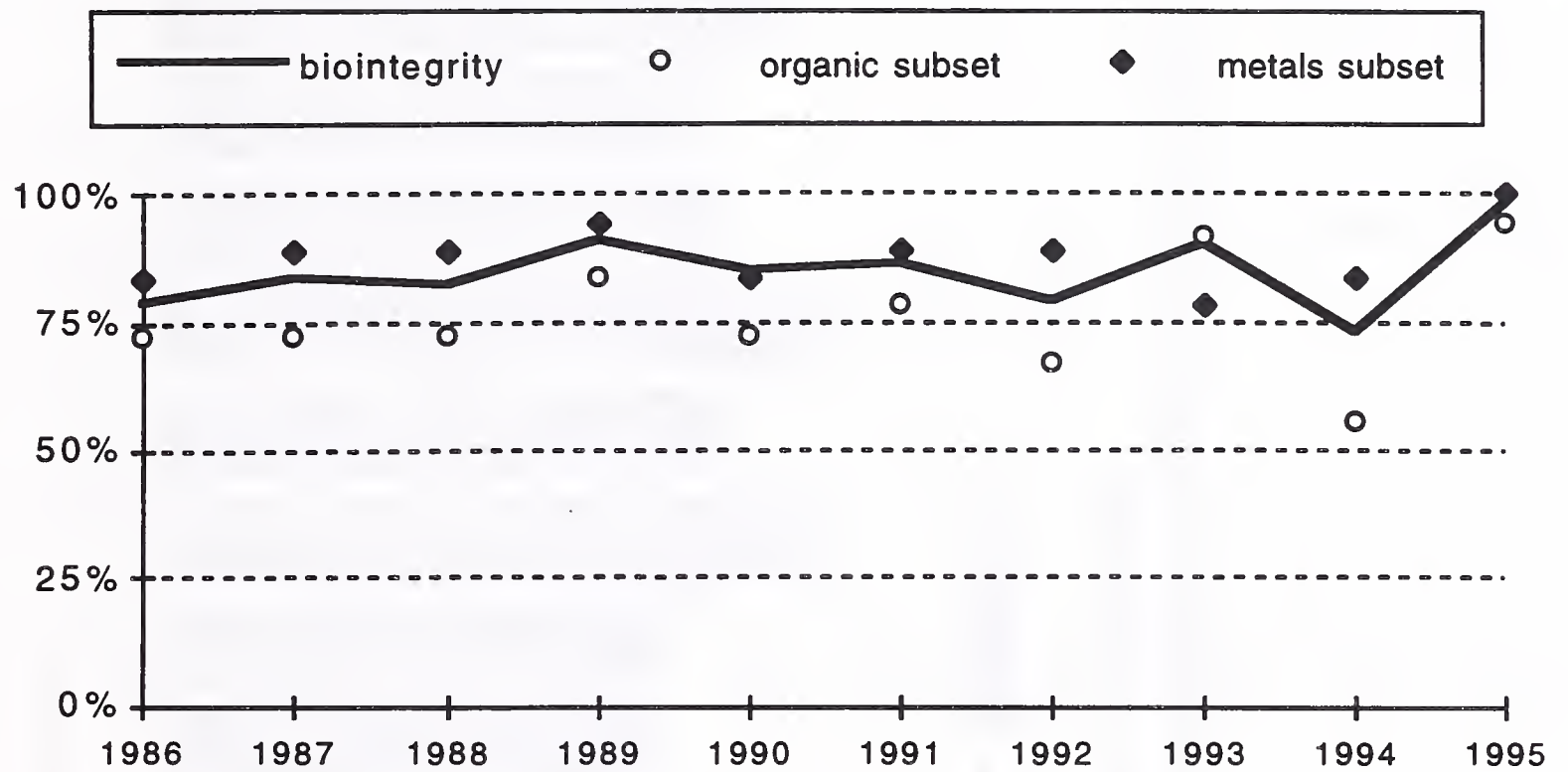


Figure 16. Mean biointegrity at 19 mainstem stations in the Clark Fork River Basin, 1986-1995.

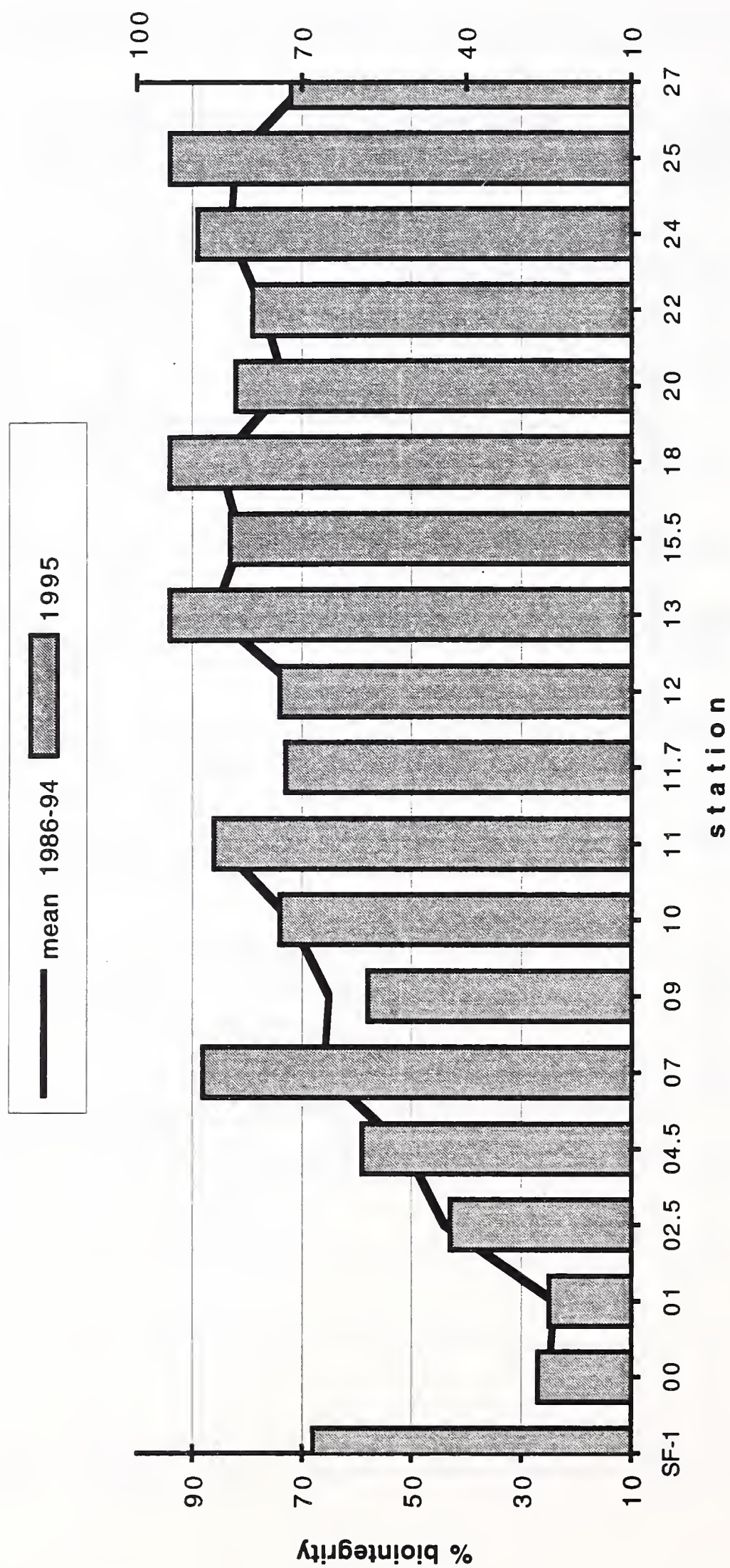


Figure 17. Biointegrity (%) in the Clark Fork River below Warm Springs Creek (station 07), 1986-1995.

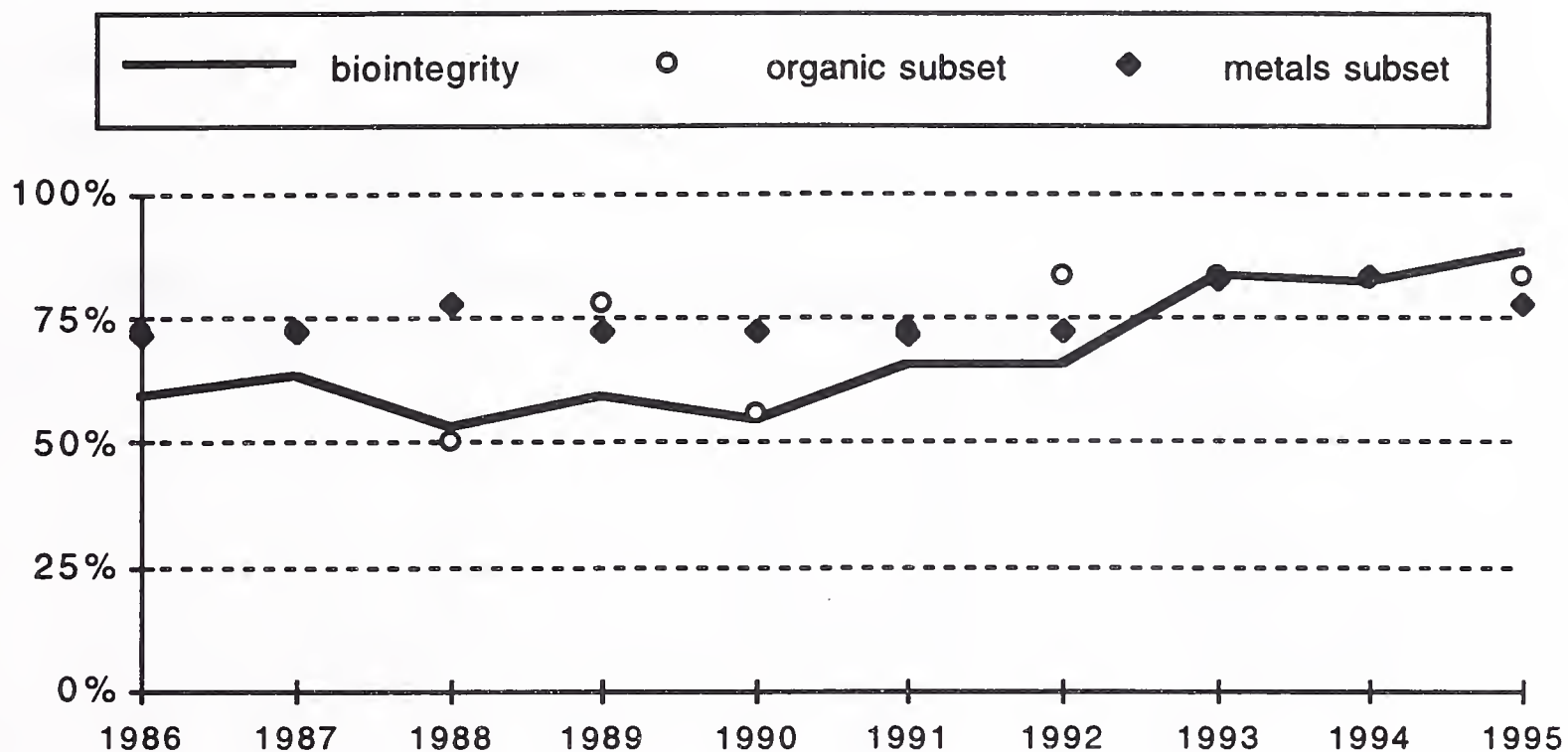


Figure 18. Biointegrity (%) in the Clark Fork River at Deer Lodge (station 09), 1986-1995.

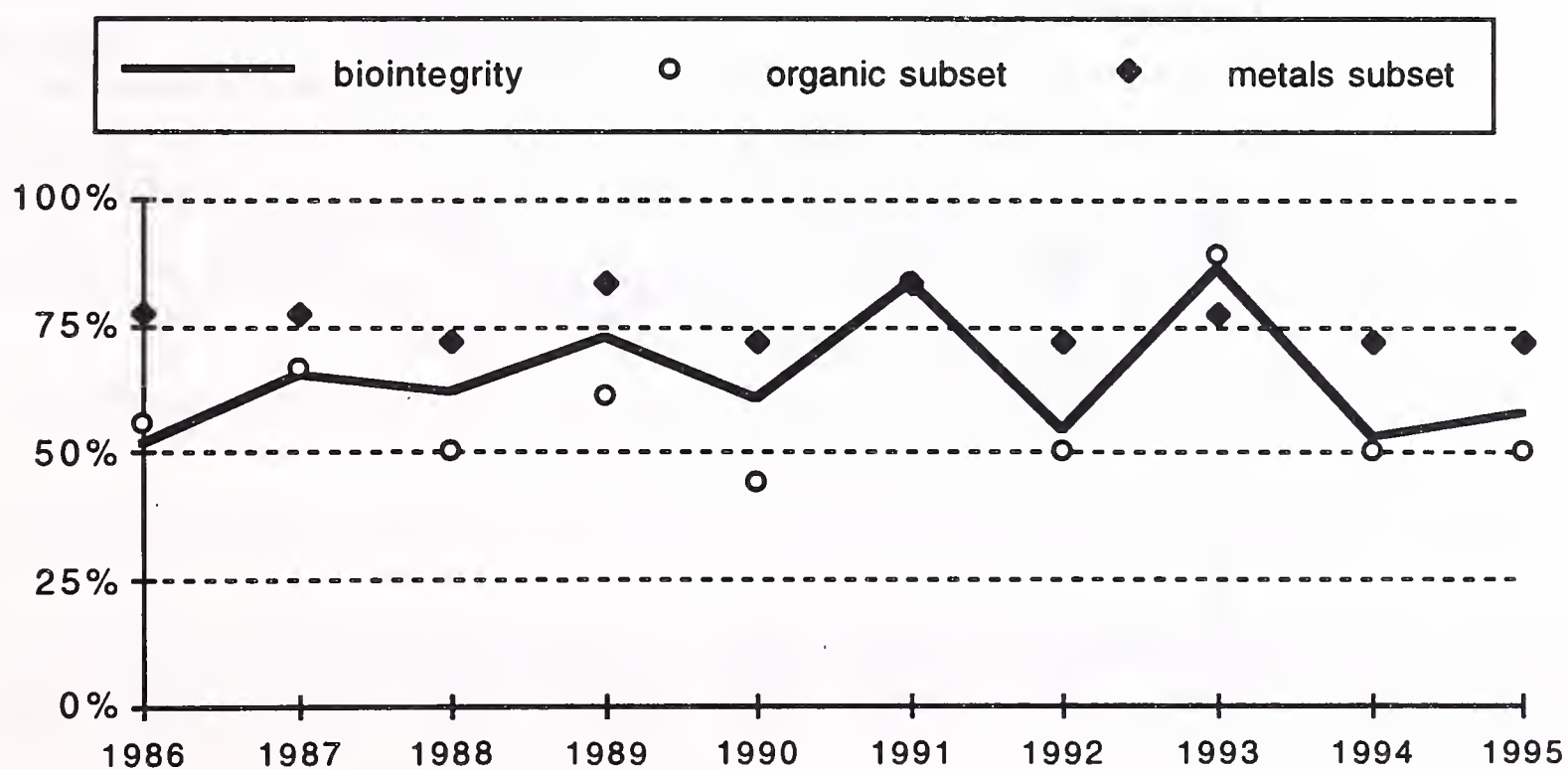


Figure 19. Biointegrity (%) in the Clark Fork River above the Little Blackfoot River (station 10), 1986-1995.

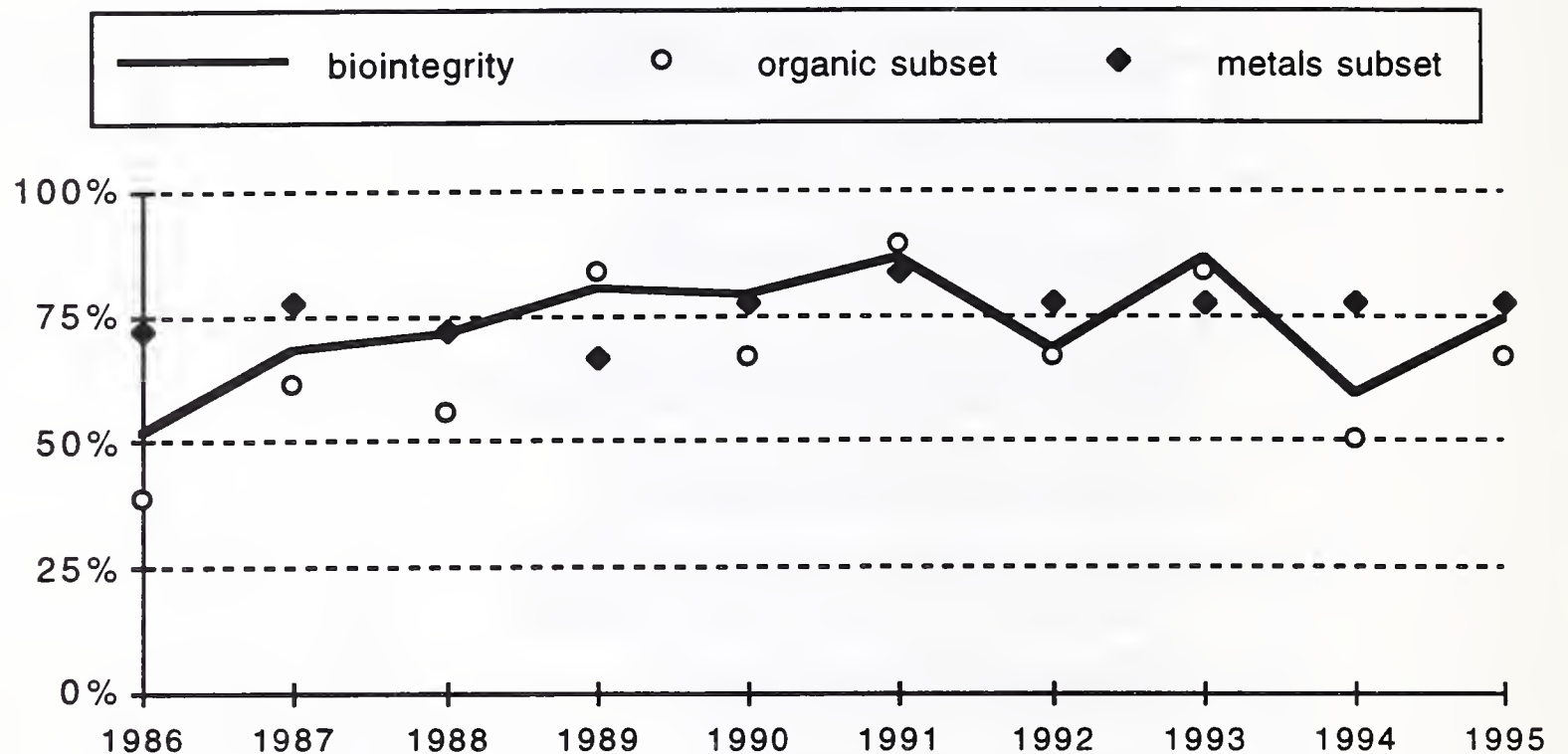


Figure 20. Biointegrity (%) in the Clark Fork River at Gold Creek Bridge (station 11), 1986-1995.

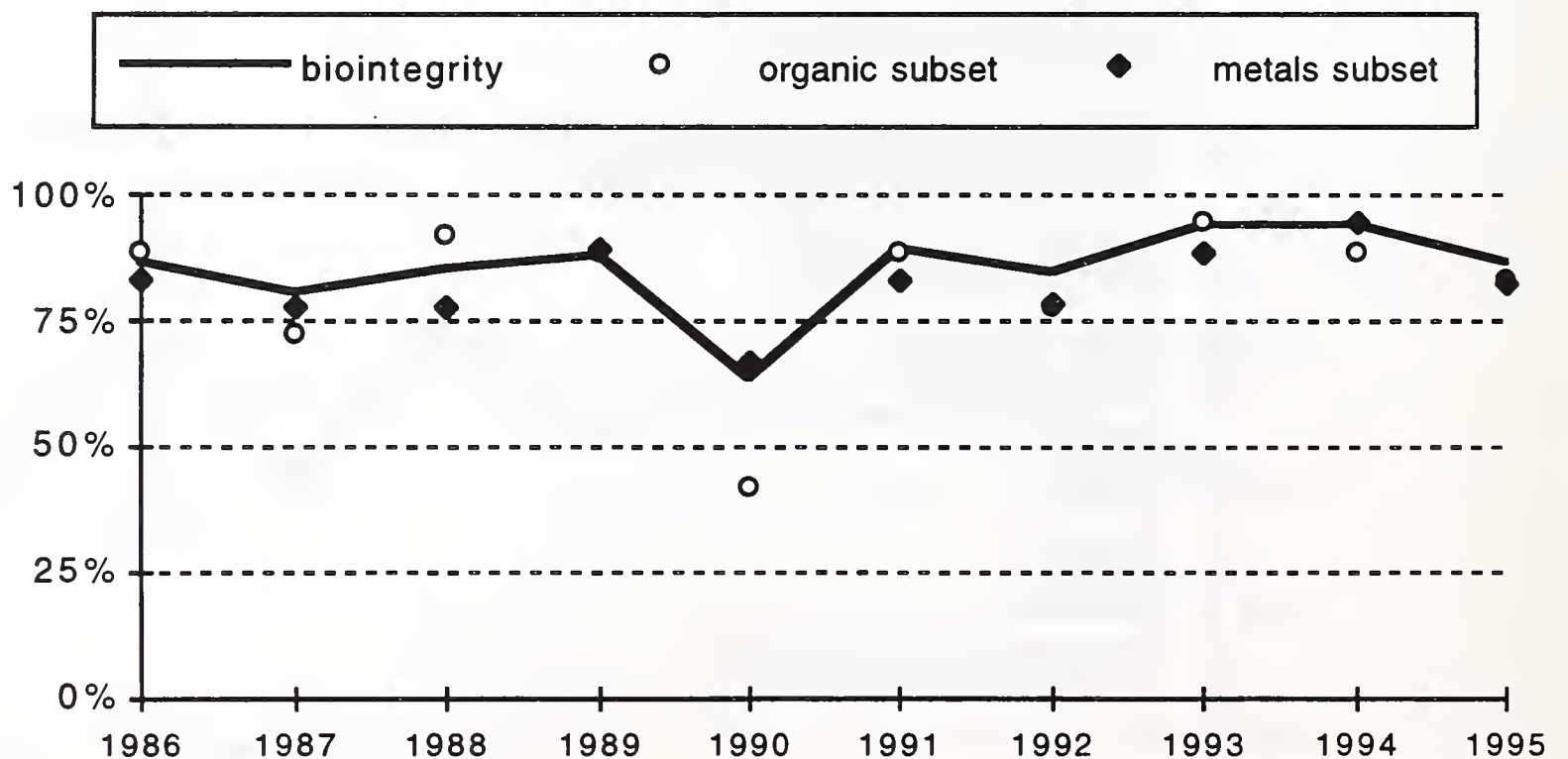


Figure 21. Biointegrity (%) in the Clark Fork River at Bearmouth (station 11.7), 1993-1995.

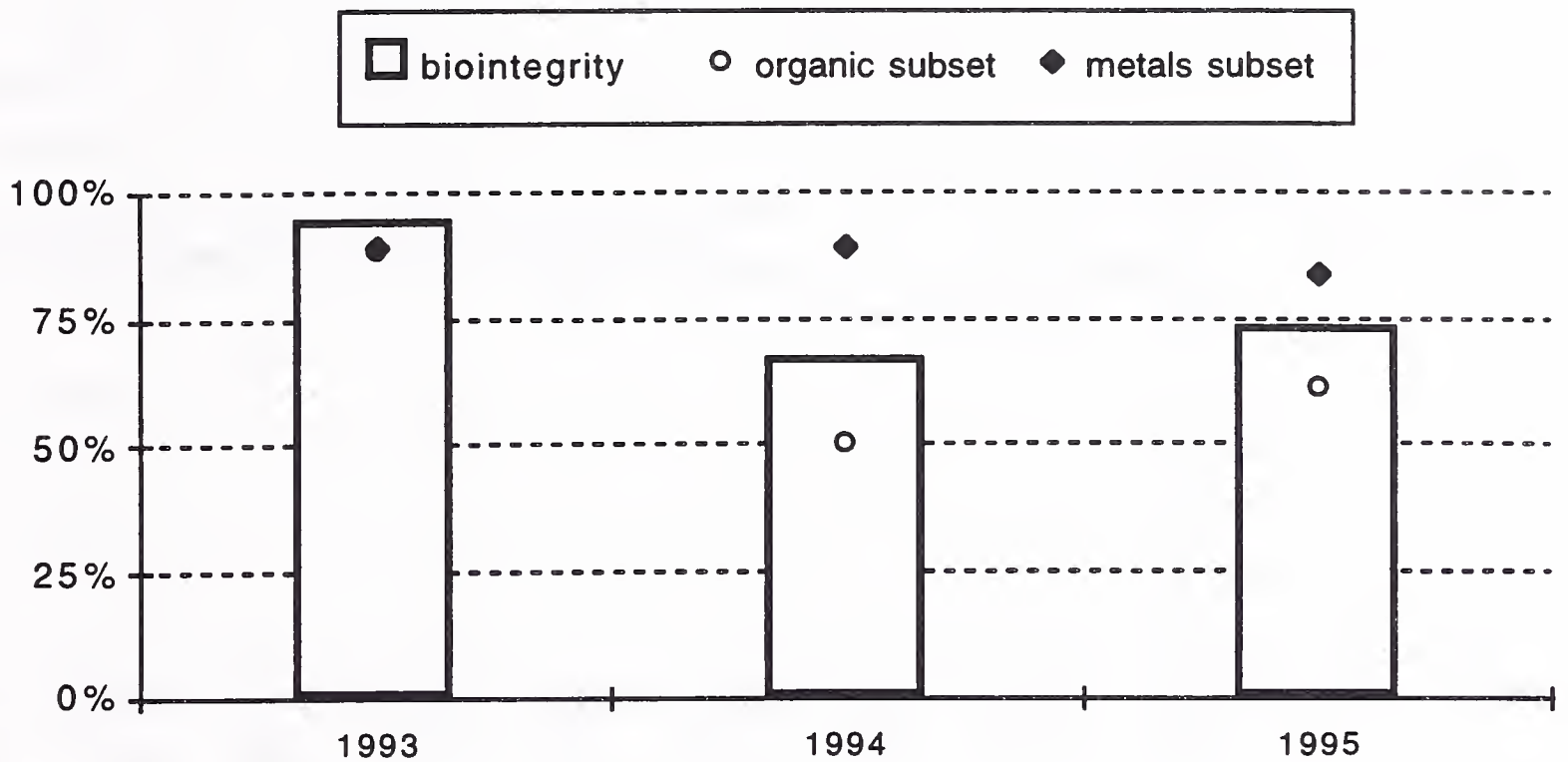


Figure 22. Biointegrity (%) in the Clark Fork River at Bonita (station 12), 1986-1995.

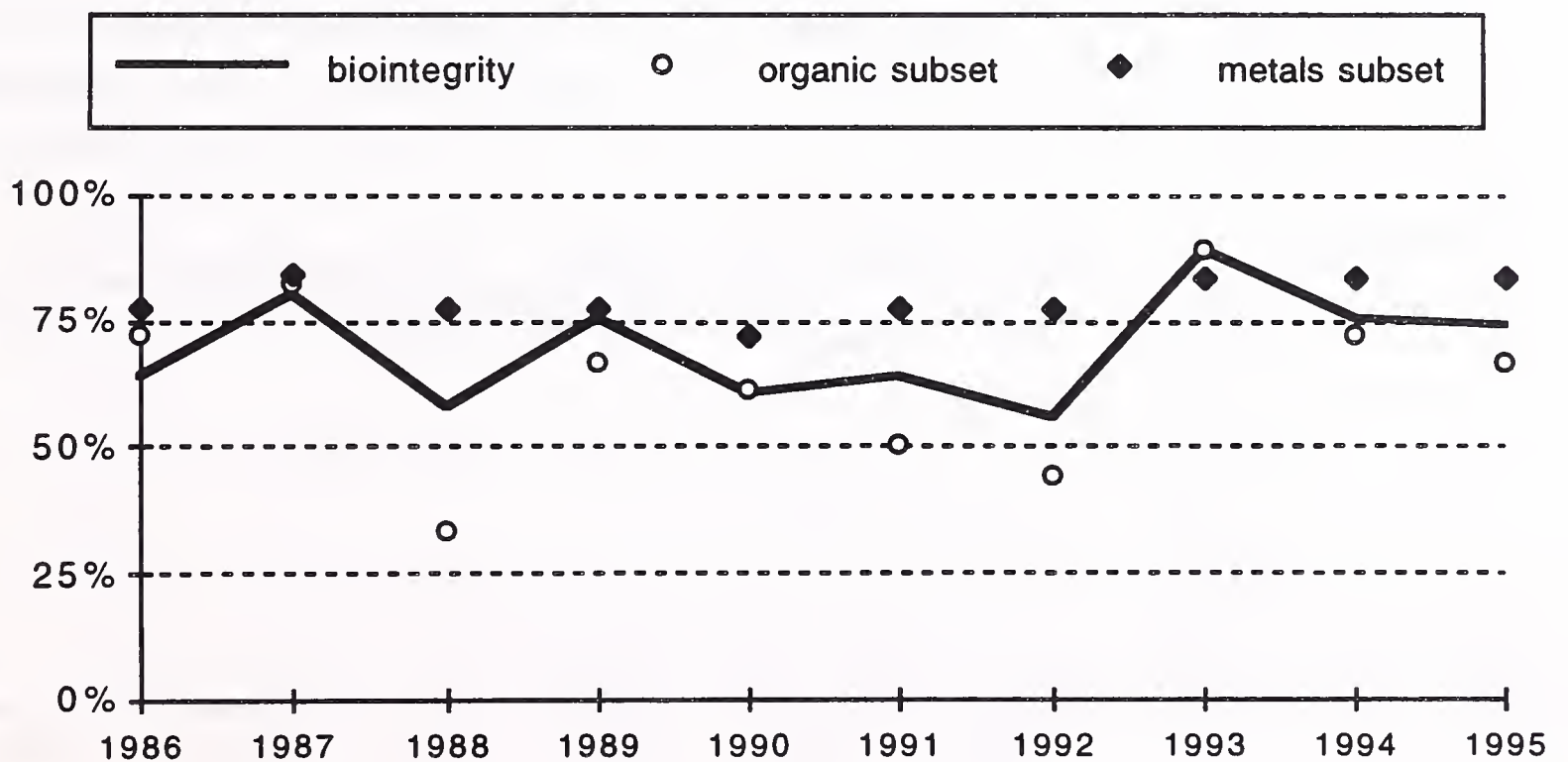


Figure 23. Biointegrity (%) in the Clark Fork River at Turah (station 13), 1986-1995.

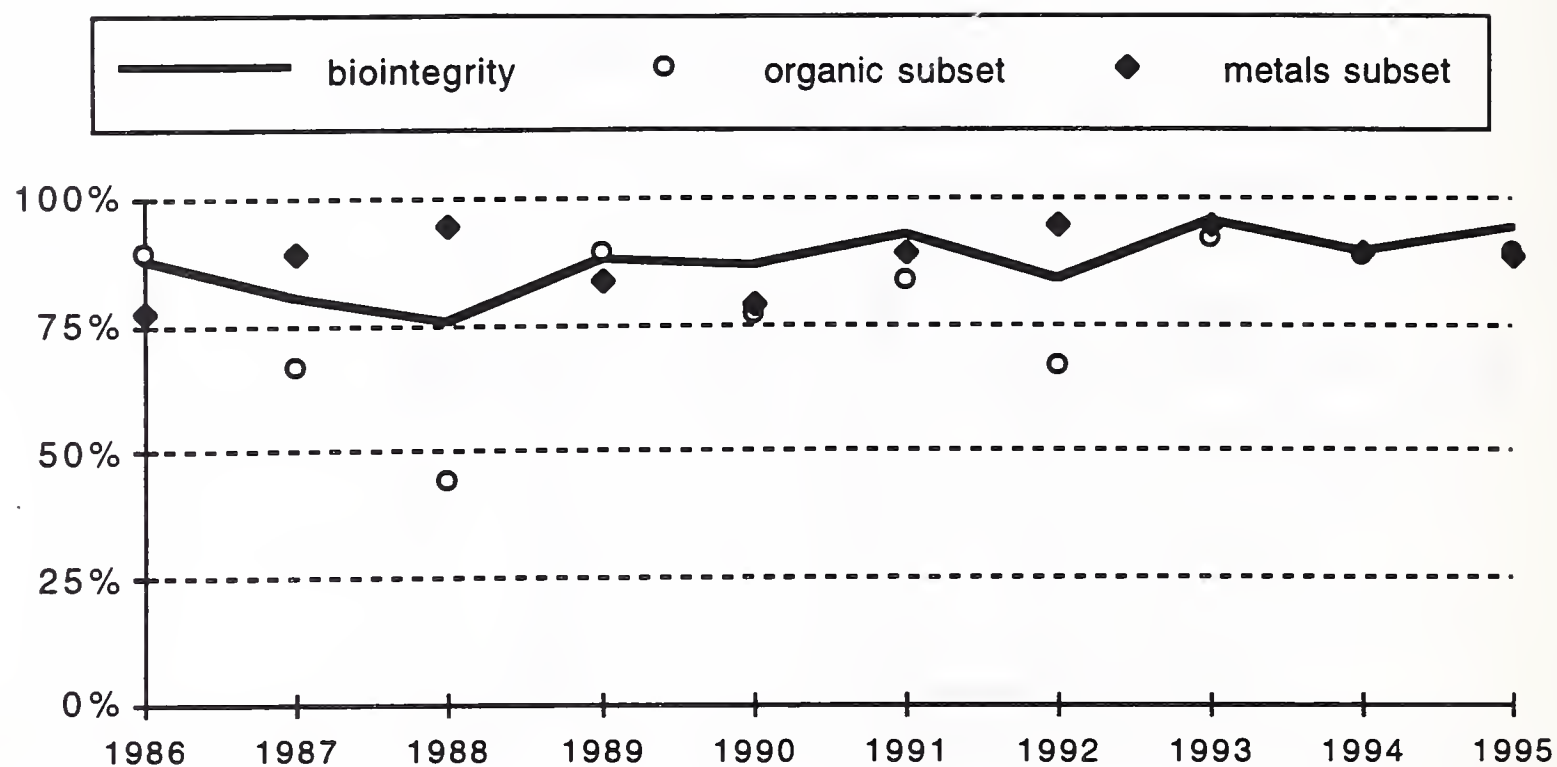


Figure 24. Biointegrity (%) in the Clark Fork River above Missoula (station 15.5), 1989-1995.

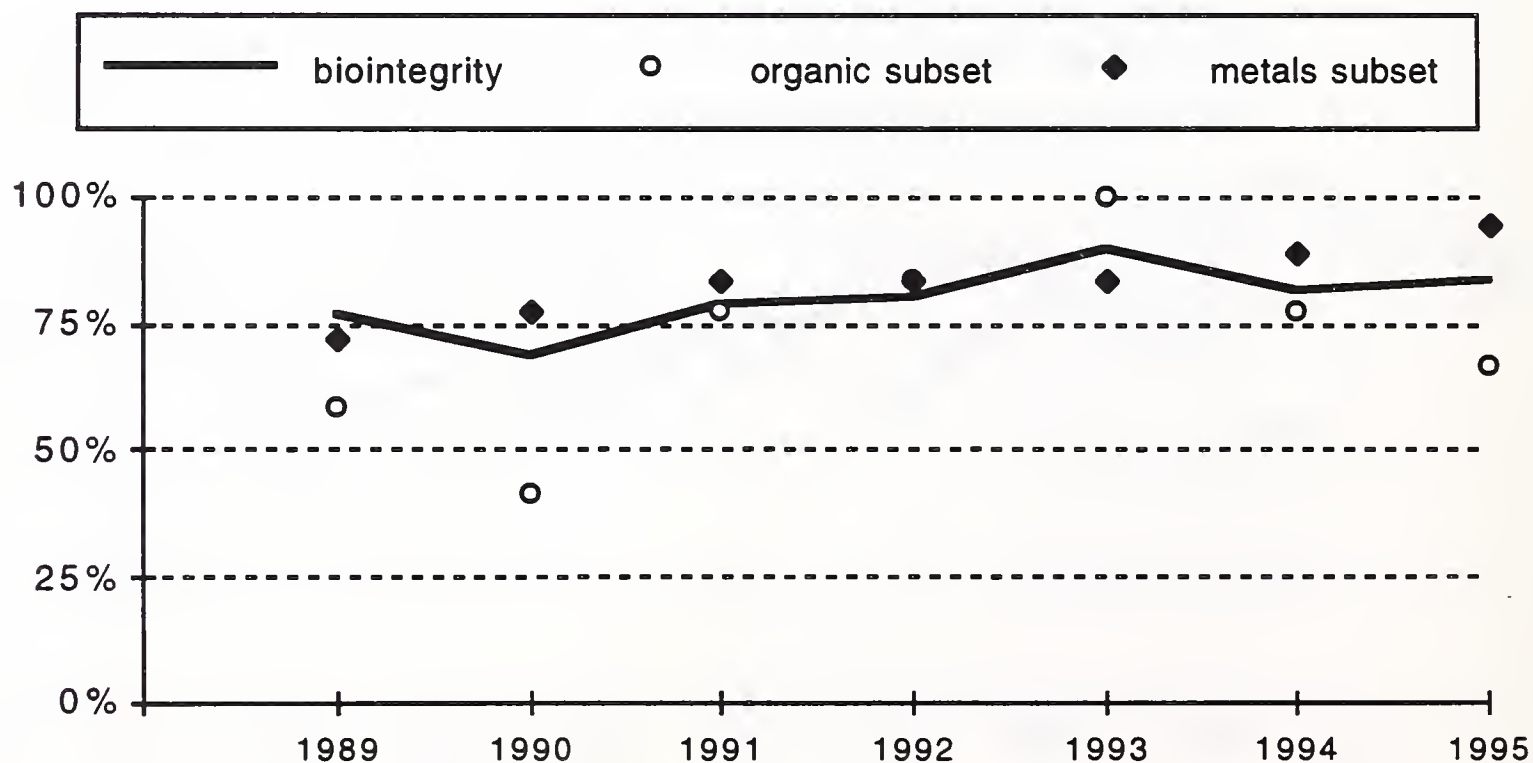


Figure 25. Biointegrity (%) in the Clark Fork River at Shuffields (station 18), 1986-1995.

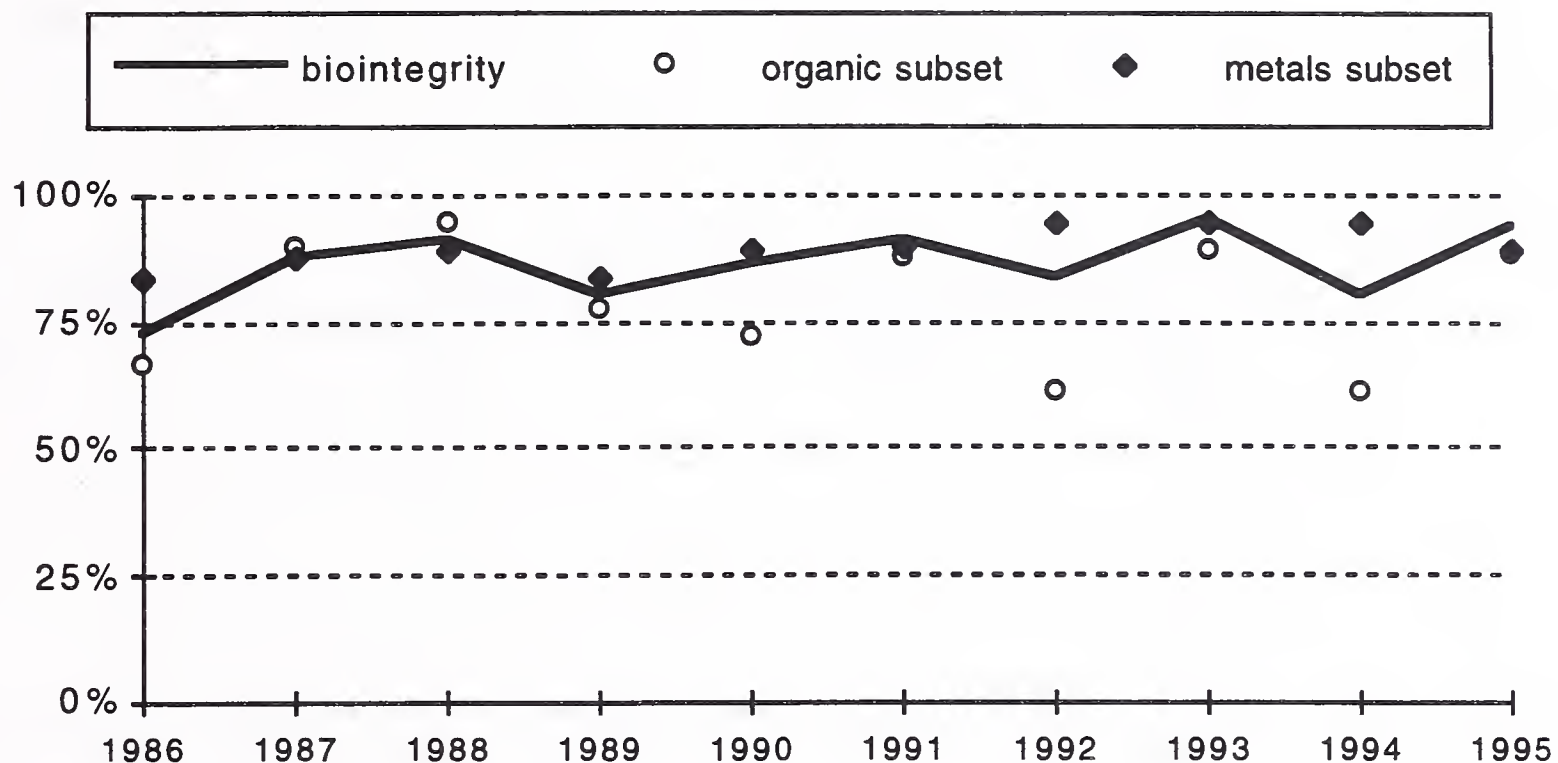


Figure 26. Biointegrity (%) in the Clark Fork River at Harper Bridge (station 20), 1986-1995.

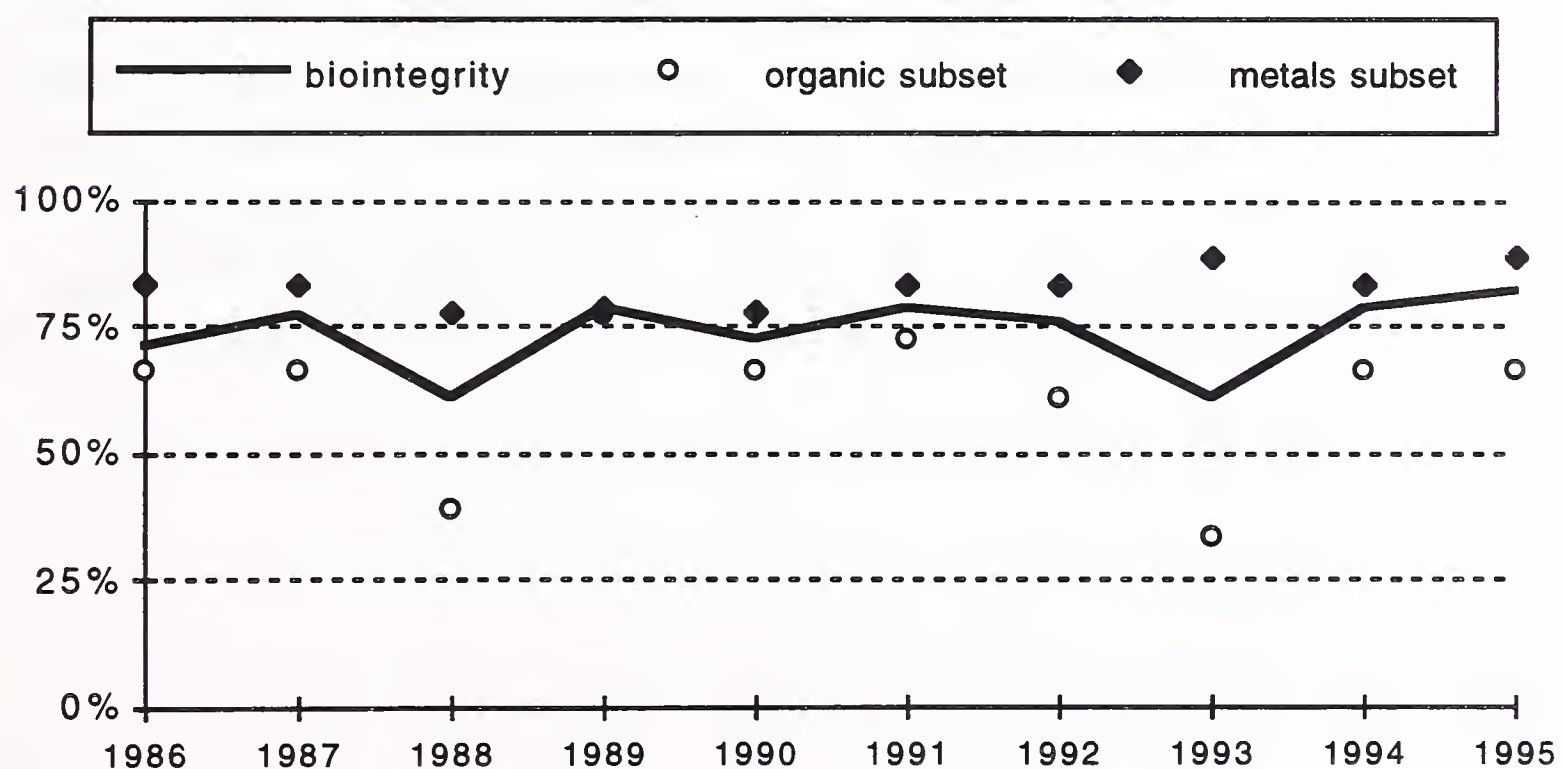


Figure 27. Biointegrity (%) in the Clark Fork River at Huson (station 22), 1986-1995.

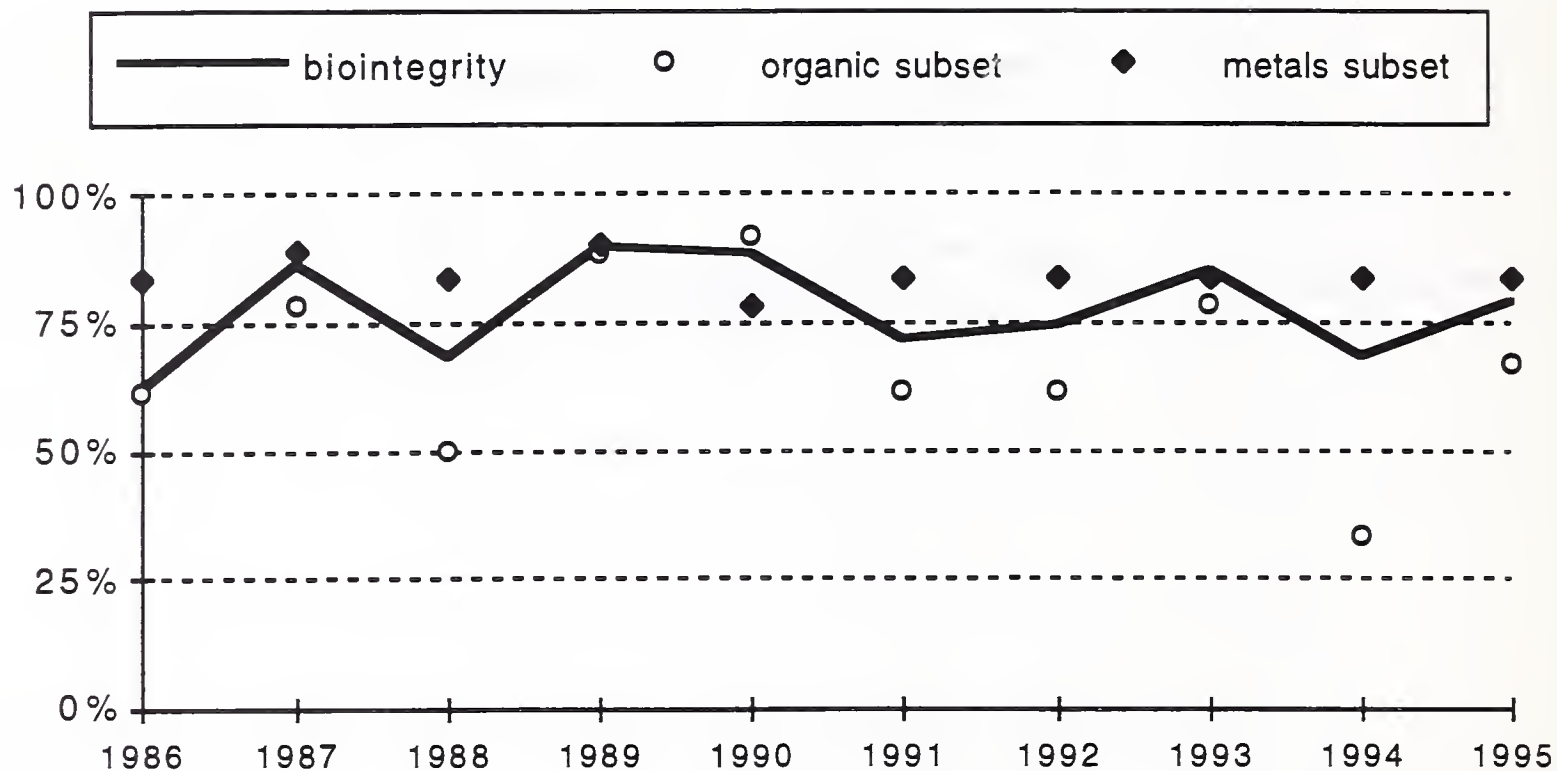


Figure 28. Biointegrity (%) in the Clark Fork River at Superior (station 24), 1986-1995.

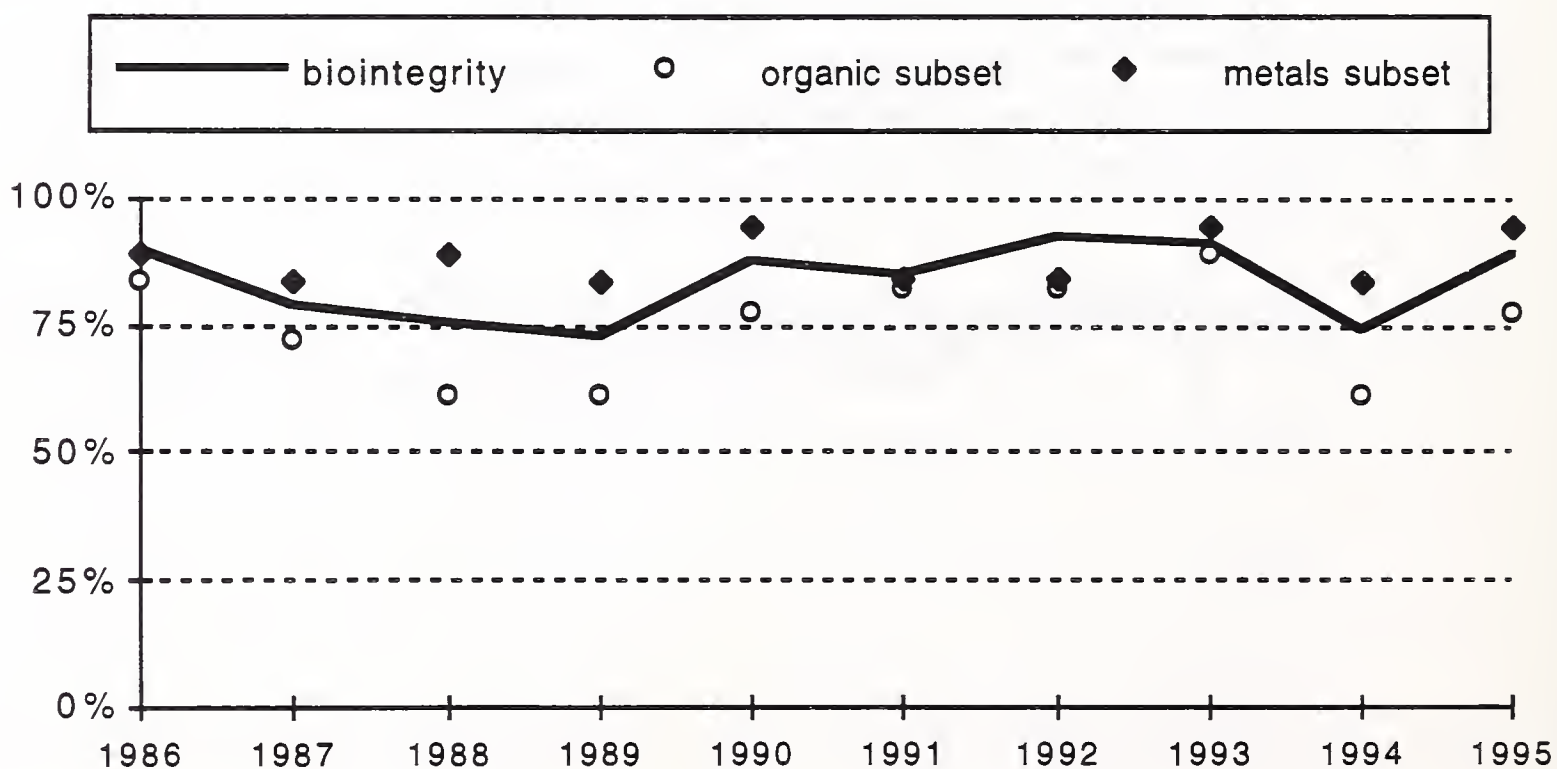


Figure 29. Biointegrity (%) in the Clark Fork River above the Flathead River (station 25), 1986-1995.

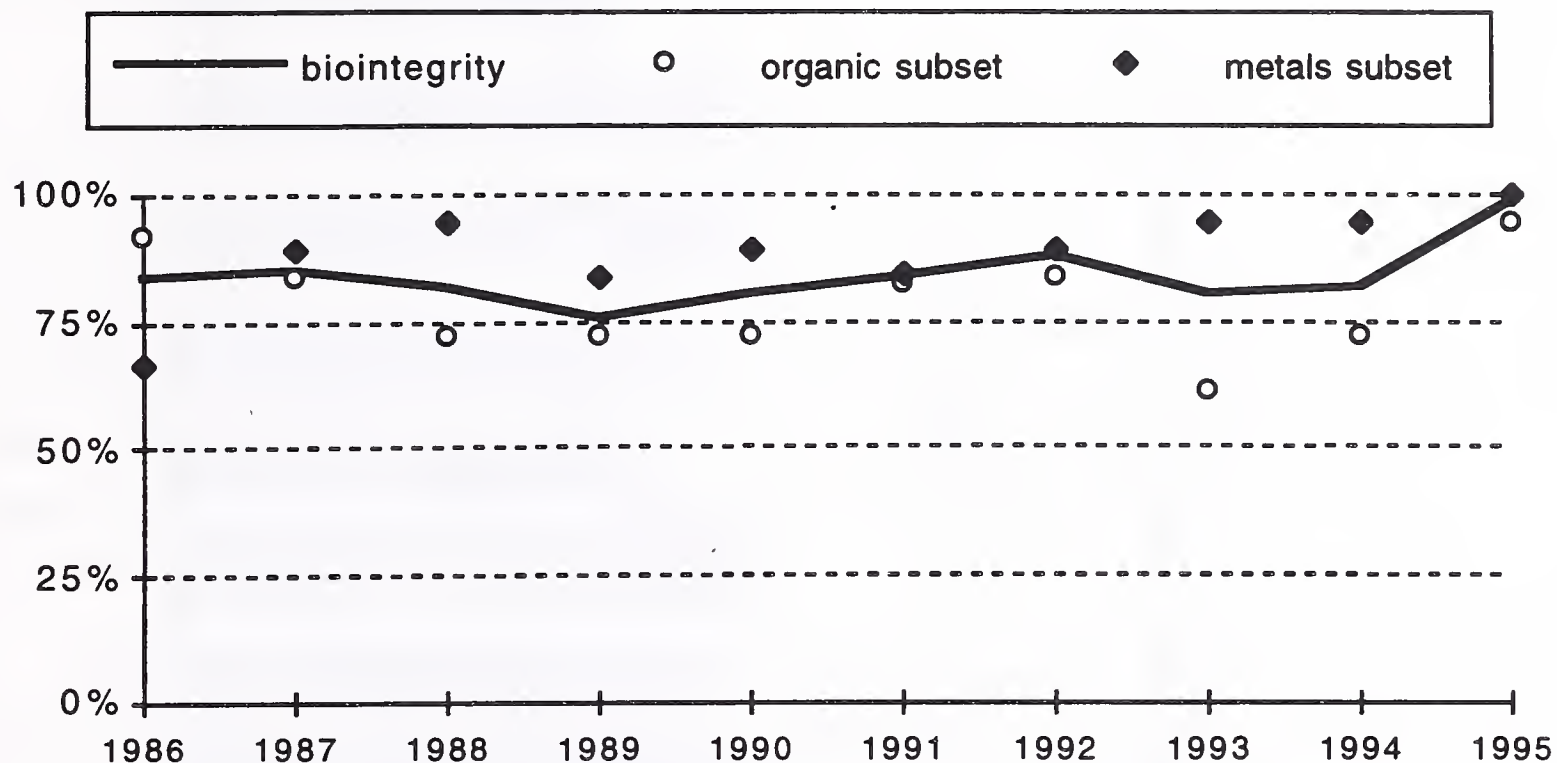


Figure 30. Biointegrity (%) in the Clark Fork River above Thompson Falls Reservoir (station 27), 1987-1995.

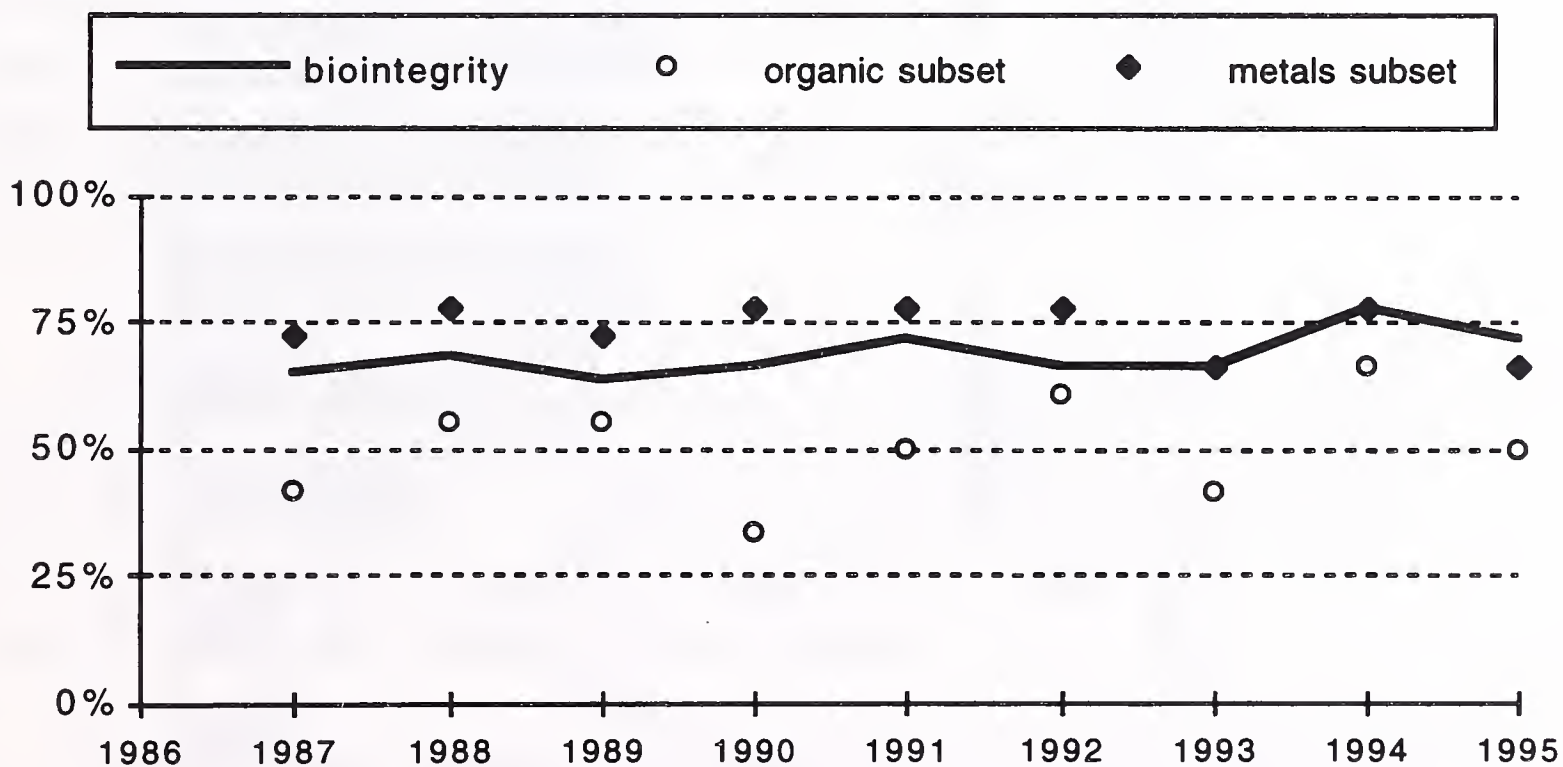
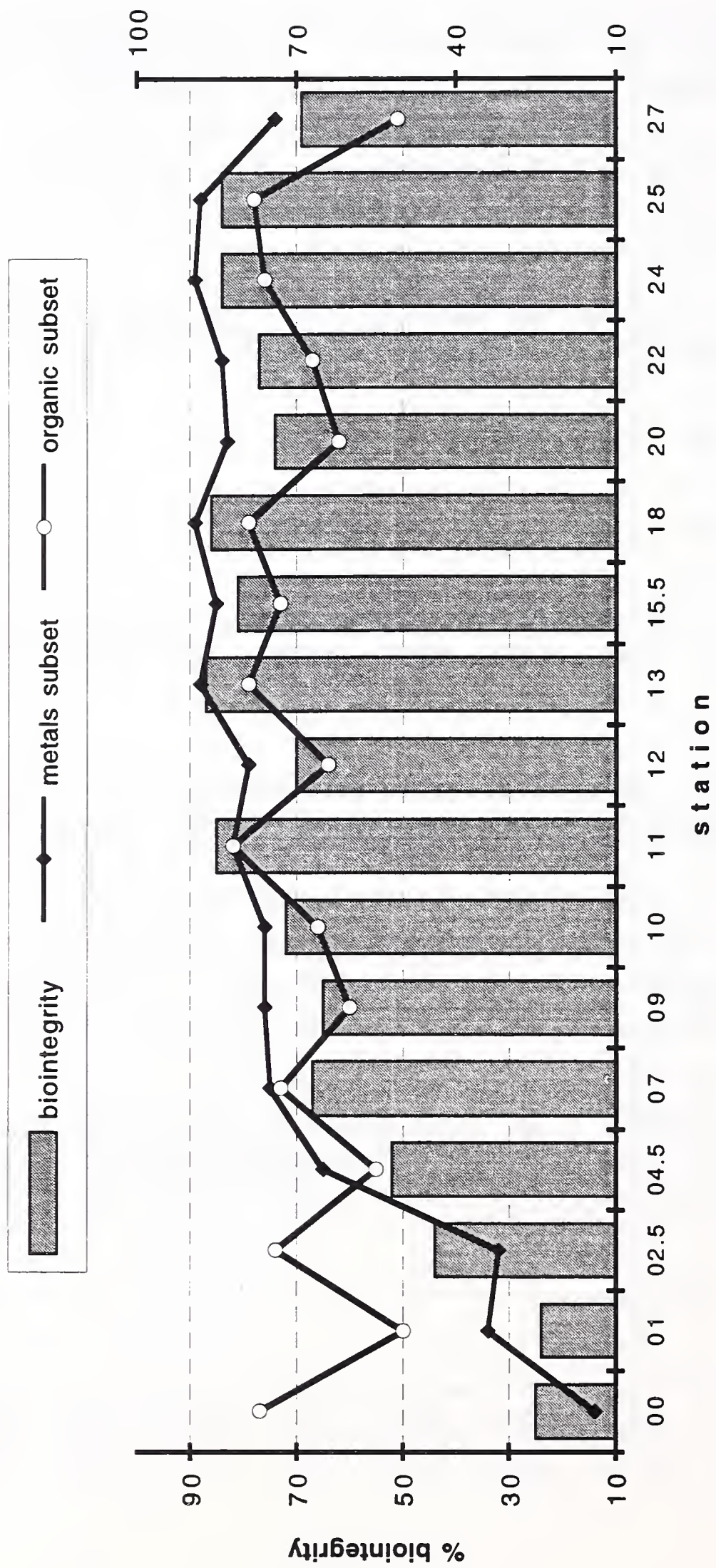


Figure 31. Mean biointegrity at 17 stations in the Clark Fork River Basin, 1986-1995.



5. CONCLUSIONS

5.1 1995 Monitoring

1. Macroinvertebrate-based bioassessments indicated continued widespread pollution in the Clark Fork River Basin. In 1995, biointegrity was impaired at 17 of 25 monitoring stations. Impacts were characterized as severe in upper Silver Bow Creek; moderate in Blacktail Creek, Silver Bow Creek below the Warm Springs Ponds and in the Clark Fork River at Deer Lodge; and slight in Warm Springs Creek and at 10 widely distributed Clark Fork River stations.
2. Biological integrity was unimpaired in the lower reaches of five Clark Fork River tributaries in 1995. There were no indications of significant pollution in the Little Blackfoot River, Flint Creek, Rock Creek, Blackfoot River or Bitterroot River.
3. Metals pollution was indicated at nine station in 1995. Metals caused severe biological impairment in Silver Bow Creek at all three stations above the Warm Springs Ponds. Slight impacts from metals were indicated in Silver Bow Creek below the Warm Springs Ponds, Blacktail Creek, and Warm Springs Creek.
4. Slight metals pollution was indicated in the upper Clark Fork River in 1995. Metals pollution contributed to reduced biointegrity in the Clark fork River from Deer Lodge to the Little Blackfoot River. In 1995, significant metals pollution was not indicated in the Clark Fork River below the confluence of the Little Blackfoot River.
5. Nutrient and organic pollution were the principal cause of slight biological impairment at most Clark Fork River stations in 1995.

5.2 Long-term Monitoring

1. Compared to 10-year means, biointegrity tended to be above average throughout the Clark Fork mainstem in 1995. Biointegrity was at least slightly higher than average at all Clark Fork River stations except Deer Lodge, where biointegrity has been well below average since 1994.
2. Since 1986, biological integrity has improved slightly at seven stations in the upper basin. Significant trends of improving biointegrity were evident in Warm Springs Creek, the Blackfoot River, at two stations in Silver Bow Creek, and the in Clark Fork River below Warm Springs Creek, at Gold Creek Bridge, and at Turah.
3. Improved biointegrity was primarily attributable to a slight, but widespread reduction in metals pollution over the past 10 years. Trend analyses of scores for metals-sensitive metrics indicated diminished metals pollution at 11 stations. Annual mean scores for the 20 long-term monitoring stations also exhibited a significant positive trend over time.
4. Blacktail Creek, although moderately impaired by metals, nutrients and sediments, was much healthier than Silver Bow Creek.
5. Upper Silver Bow Creek was severely impaired by metals, nutrients and organic pollutants throughout the 10-year monitoring period. Metals were clearly the most deleterious pollutants in this reach.
6. The Warm Springs treatment ponds reduced pollution in Silver Bow Creek. Biological integrity was slightly to moderately impaired in Silver Bow Creek below the ponds from 1993 to 1995. Prior to 1993, monitoring at a different location indicated severe impairment below the ponds.

7. Lower Warm Springs Creek was slightly impaired by metals in 1995. Since 1986, significant trends of reduced metals pollution and increased biological integrity were evident at this site.

8. Biointegrity has improved significantly at the uppermost station on the Clark Fork River since 1992. The Clark Fork River below the Warm Springs Ponds was moderately impaired from 1986 through 1992, but was only slightly impaired from 1993 to 1995.

9. Improved biointegrity in lower Silver Bow Creek and the upper station on the Clark Fork River coincided with recent reclamation activities in and around the Warm Springs treatment ponds.

10. In most years, biological integrity was moderately impaired in the Clark Fork River from Deer Lodge to the Little Blackfoot River. Biointegrity was impaired in this reach by a combination of nutrient/organic and metals pollution. While slight metals pollution has consistently been indicated, nutrient/organic pollution tended to be more severe. Impacts in this reach were accentuated by low summer stream flows.

11. Significant nutrient/organic pollution was usually indicated in the Clark Fork River below the confluence of the Bitterroot River to Huson. Slight to moderate impacts in this reach were attributed to nutrients from the Missoula WWTP, the Bitterroot River, and the Stone Container Corporation Frenchtown kraft mill.

12. Based on 10 years of monitoring, the healthiest reaches of the Clark Fork River include stations at the Gold Creek Bridge, Turah, Shuffield's and the reach from Superior to the confluence of the Flathead River.

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APPENDIX A:

**Macroinvertebrate checklist for the Clark Fork Basin
with biotic and metals tolerance values**

Appendix A. Aquatic macroinvertebrates collected from the Clark Fork River Basin during August, 1986-1995 and tolerance values used to calculate biotic and metals tolerance indices.

class	order	family	genus	species	biotic index	metals tolerance	
INSECTA							
	Coleoptera						
		Dytiscidae				7	
			<i>Agabetes sp.</i>				
			<i>Agabinus sp.</i>				
			<i>Agabus sp.</i>				
			<i>Deronectes sp.</i>				
			<i>Hydroprus sp.</i>				
			<i>Hydrovatus sp.</i>				
			<i>Hygrotus sp.</i>				
			<i>Illybius sp.</i>				
			<i>Oreodytes spp.</i>				
		Elmidae					
			<i>Cleptelmis ornata</i>		4	4	
			<i>Dubiraphia sp.</i>		6	4	
			<i>Heterlimnius corpulentus</i>		3	3	
			<i>Lara avara</i>		1	1	
			<i>Microcylloepus sp.</i>		5	4	
			<i>Narpus concolor</i>		2	1	
			<i>Optioservus spp.</i>		5	5	
			<i>Ordobrevia sp.</i>		5	3	
			<i>Stenelmis sp.</i>		5	3	
			<i>Zaitzevia parvula</i>		4	3	
		Halipilidae				5	7
			<i>Brychius sp.</i>				
			<i>Halipilus sp.</i>				
			<i>Peltodytes sp.</i>				
		Hydrophilidae					7
	Plecoptera						
		Capniidae				1	0
		Chloroperlidae					
			Chloroperlinae		1	2	
			<i>Kathroperla perdita</i>		1	2	
		Nemouridae					
			<i>Amphinemura sp.</i>		2	1	
			<i>Zapada cinctipes</i>		3	3	
			<i>Zapada oregonensis gp.</i>		2	2	
			<i>Malenka sp.</i>		1	1	
		Perlidae					
			<i>Calineuria californica</i>		2	3	
			<i>Claassenia sabulosa</i>		3	3	
			<i>Hesperoperla pacifica</i>		1	3	

Appendix A. continued.

class	order	family	genus	species	biotic index	metals tolerance
		Perlodidae				
			<i>Cultus</i>	<i>sp.</i>	2	2
			<i>Isoperla</i>	<i>sp.</i>	2	3
			<i>Isogenoides</i>	<i>sp.</i>	3	2
			<i>Skwala</i>	<i>sp.</i>	3	3
		Pteronarcidae				
			<i>Pteronarcella</i>	<i>badia</i>	3	4
			<i>Pteronarcys</i>	<i>californica</i>	2	1
		Taeniopterygidae			2	1
Diptera		Chironomidae				
		Tanypodinae				
			<i>Ablabesmyia</i>	<i>sp.</i>	8	3
			<i>Alotanypus</i>	<i>sp.</i>	6	8
			<i>Brundiniella</i>	<i>sp.</i>	3	7
			<i>Macropelopia</i>	<i>sp.</i>	6	5
			<i>Thienemannimyia</i>	<i>gp.</i>	5	3
			<i>Pentaneura</i>	<i>sp.</i>	6	2
			<i>Procladius</i>	<i>sp.</i>	9	5
		Diamesinae				
			<i>Diamesa</i>	<i>sp.</i>	5	9
			<i>Pagastia</i>	<i>sp.</i>	1	9
			<i>Potthastia</i>	<i>gaedii gp.</i>	2	5
			<i>P. longimanus</i>	<i>gp.</i>	2	5
		Prodiamesinae				
			<i>Monodiamesa</i>	<i>sp.</i>	7	5
			<i>Odontomesa</i>	<i>sp.</i>	4	5
			<i>Prodiamesa</i>	<i>sp.</i>	3	3
		Orthocladinae				
			<i>Brillia</i>	<i>sp.</i>	4	4
			<i>Cardiocladius</i>	<i>spp.</i>	5	9
			<i>Corynoneura</i>	<i>sp.</i>	7	4
			<i>Cricotopus</i>	<i>spp.</i>	7	10
			<i>C. (Nostococladius)</i>	<i>sp.</i>	6	5
			<i>Eukiefferiella</i>	<i>spp.</i>	8	9
			<i>E. (devonica)</i>	<i>gp.</i>	8	7
			<i>Nanocladius</i>	<i>sp.</i>	3	4
			<i>Orthocladius</i>	<i>spp.</i>	6	5
			<i>Parametriocnemus</i>	<i>sp.</i>	5	4
			<i>Paraphaenocladius</i>	<i>sp.</i>	4	4
			<i>Rheocricotopus</i>	<i>sp.</i>	4	5
			<i>Symbiocladius</i>	<i>sp.</i>	4	1
			<i>Synorthocladius</i>	<i>sp.</i>	2	1
			<i>Tvetenia</i>	<i>sp.</i>	5	4

Appendix A. continued.

class	order	family	genus	species	biotic index	metals tolerance
		Chironominae				
		Chironomini				
			<i>Chironomus</i>	<i>sp.</i>	10	7
			<i>Cryptochironomus</i>	<i>sp.</i>	8	5
			<i>Demicryptochironomus</i>	<i>sp.</i>	8	4
			<i>Dicrotendipes</i>	<i>sp.</i>	8	5
			<i>Endochironomus</i>	<i>sp.</i>	10	6
			<i>Glyptotendipes</i>	<i>sp.</i>	10	4
			<i>Microtendipes</i>	<i>sp.</i>	6	4
			<i>Parachironomus</i>	<i>sp.</i>	10	4
			<i>Paracladopelma</i>	<i>sp.</i>	7	4
			<i>Phaenopsectra</i>	<i>sp.</i>	7	4
			<i>Polypedilum</i>	<i>spp.</i>	6	4
			<i>Psuedochironomus</i>	<i>sp.</i>	5	4
			<i>Xenochironomus</i>	<i>sp.</i>	4	0
		Tanytarsini				
			<i>Cladotanytarsus</i>	<i>sp.</i>	7	3
			<i>Micropsectra</i>	<i>spp.</i>	4	1
			<i>Paratanytarsus</i>	<i>sp.</i>	6	3
			<i>Stempellina</i>	<i>sp.</i>	2	0
			<i>Rheotanytarsus</i>	<i>sp.</i>	6	1
			<i>Tanytarsus</i>	<i>sp.</i>	6	3
		Tipulidae				
			<i>Antocha</i>	<i>sp.</i>	3	4
			<i>Dicranota</i>	<i>sp.</i>	3	2
			<i>Hesperoconpa</i>	<i>sp.</i>	1	1
			<i>Hexatoma</i>	<i>sp.</i>	2	2
			<i>Limnonia</i>	(?) <i>sp.</i>	3	2
			<i>Ormosia</i>	(?) <i>sp.</i>	6	3
			<i>Tipula</i>	<i>sp.</i>	4	3
		Athericidae				
			<i>Atherix</i>	<i>pachypus</i>	4	4
		Simuliidae				
			<i>Simulium</i>	(<i>Eusimulium</i>) <i>spp.</i>	5	5
			<i>Simulium</i>	(<i>Psilozoa</i>) <i>sp.</i>	7	7
		Empididae				
			<i>Chelifera</i>	<i>sp.</i>	5	4
			<i>Clinocera</i>	<i>sp.</i>	5	4
			<i>Hemerodromia</i>	<i>sp.</i>	6	4
		Tanyteridae				
			<i>Protanyderus</i>	<i>sp.</i>	5	1
		Muscidae				
			<i>Limnophora</i>	<i>sp.</i>	6	7

Appendix A. continued.

class	order	family	genus species	biotic index	metals tolerance
		Ceratopogonidae			
			Ceratopogoninae	6	4
		Culicidae			
			<i>Aedes sp.</i>	7	5
		Dolichopodidae		4	4
		Tabanidae		6	3
		Stratiomyidae			
			<i>Euparyphus sp.</i>	7	4
		Psychodidae			
			<i>Pericoma sp.</i>	4	4
Hemiptera					
		Corixidae			5
			<i>Hesperocorixa laevigata</i>		
			<i>Sigara sp.</i>		
		Saldidae			
			<i>Salda sp.</i>		
Lepidoptera					
		Pyralidae			
			<i>Petrophila sp.</i>	5	3
Megaloptera					
		Sialidae			
			<i>Sialis sp.</i>	4	4
Odonata					
		Gomphidae			
			<i>Ophiogomphus sp.</i>	5	4
Ephemeroptera					
		Baetidae			
			<i>Acentrella insifnificans</i>	4	4
			<i>A. turbida</i>	4	3
			<i>Baetis punctiventris (Psuedocloeon)</i>	6	3
			<i>B. tricaudatus</i>	4	5
			<i>Callibaetis sp.</i>	9	1
			<i>Centroptilum sp.</i>	2	1
			<i>Dipheter hageni</i>	5	1
		Ephemerellidae			
			<i>Attenella margarita</i>	3	1
			<i>Caudatella heterocaudata</i>	0	0
			<i>Drunella coloradensis</i>	0	0
			<i>D. doddsi</i>	1	0
			<i>D. flavilinea</i>	2	0
			<i>D. grandis</i>	2	1
			<i>Ephemerella inermis</i>	4	3
			<i>Serratella tibialis</i>	2	1
			<i>Timpanoga hecuba</i>	2	1

Appendix A. continued.

class	order	family	genus	species	biotic index	metals tolerance
		Heptageniidae				
			<i>Cinygmula</i>	<i>sp.</i>	0	0
			<i>Epeorus</i>	<i>spp.</i>	2	0
			<i>E.</i>	<i>albertae</i>	2	0
			<i>E.</i>	<i>grandis</i>	0	0
			<i>E.</i>	<i>longimanus</i>	1	0
			<i>Heptagenia</i>	<i>soltari</i>	3	1
			<i>Nixe</i>	<i>sp.</i>	4	1
			<i>Rhithrogena</i>	<i>sp.</i>	0	2
			<i>Stenonema</i>	<i>(termintum)?</i>	4	1
		Leptophlebiidae				
			<i>Paraleptophlebia</i>	<i>spp.</i>	1	1
			<i>P.</i>	<i>bicornuta</i>	2	1
			<i>P.</i>	<i>debilis</i>	1	1
		Siphonuridae				
			<i>Ameletus</i>	<i>sp.</i>	0	1
		Tricorythidae				
			<i>Tricorythodes</i>	<i>minutus</i>	4	4
Trichoptera		Brachycentridae				
			<i>Brachycentrus</i>	<i>americanus</i>	1	4
			<i>Brachycentrus</i>	<i>occidentalis</i>	2	3
			<i>Micrasema</i>	<i>bactro</i>	1	2
		Glossosomatidae				
			<i>Agapetus</i>	<i>sp.</i>	0	2
			<i>Glossosoma</i>	<i>sp.</i>	0	2
			<i>Protoptila</i>	<i>sp.</i>	1	2
		Helicopsycidae				
			<i>Helicopsyche</i>	<i>sp.</i>	3	3
		Hydropsychidae				
			<i>Arctopsyche</i>	<i>grandis</i>	2	3
			<i>Cheumatopsyche</i>	<i>spp.</i>	5	5
			<i>Hydropsyche</i>	<i>spp.</i>	5	5
			<i>H. (H.)</i>	<i>occidentalis</i>	5	5
			<i>H. (Ceratopsyche)</i>	<i>spp.</i>	5	5
			<i>H.(C.)</i>	<i>cockerelli</i>	4	4
			<i>H. (C.)</i>	<i>morosa?</i>	6	5
			<i>H. (C.)</i>	<i>oslari</i>	3	6
			<i>H. (C.)</i>	<i>slossonae</i>	4	6

Appendix A. continued.

class	order	family	genus	species	biotic index	metals tolerance
		Hydroptilidae				
			<i>Allisotrichia</i>	(<i>Rioptila</i> ?) sp.	6	2
			<i>Hydroptila</i>	spp.	6	4
			<i>Leucotrichia</i>	<i>pictipes</i>	2	1
			<i>Neotrichia</i>	sp.	2	2
			<i>Ochrotrichia</i>	sp.	4	3
			<i>Oxyethira</i>	sp.	3	2
			<i>Zumatrichia</i>	<i>notosa</i>	3	1
		Lepidostomatidae				
			<i>Lepidostoma</i>	sp.	1	1
		Leptoceridae				
			<i>Ceraclea</i>	sp.	3	1
			<i>Oecetis</i>	sp.	8	3
			<i>Nectopsyche</i>	sp.	3	3
			<i>Trianodes</i>	sp.	6	1
		Limnephilidae				
			<i>Dicosmoecus</i>	sp.	2	1
			<i>Ecclisomyia</i>	sp.	4	2
			<i>Limnephilus</i>	sp.	3	2
			<i>Onocosmoecus</i>	sp.	3	2
			<i>Neophylax</i>	sp.	3	2
			<i>Psychoglypha</i>	sp.	0	2
		Philopotamidae				
			<i>Wormaldia</i>	sp.	0	1
		Polycentropididae				
			<i>Polycentropus</i>	sp.	6	1
		Psychomyiidae				
			<i>Psychomyia</i>	sp.	2	1
		Rhyacophilidae				
			<i>Rhyacophila</i>	<i>angelita</i> gp.	0	1
			<i>R.</i>	<i>coloradensis</i> gp.	0	1
			<i>R.</i>	<i>brunnea</i> gp.	2	1

Appendix A. concluded.

class	order	family	genus	species	biotic index	metals tolerance
ANNELIDA						
	Oligochaeta					
		Enchytraeidae			4	1
		Lumbricidae			4	1
		Lumbriculidae			4	1
		Naididae			8	5
		Tubificidae			10	6
	Hirudinea					
		Erpobdellidae			8	4
		Glossophoniidae			9	4
			<i>Glossiphonia complanata</i>		9	4
			<i>Helobdella stagnalis</i>		10	4
CRUSTACEA						
	Amphipoda					
		Gammaridae				
			<i>Gammarus sp.</i>		4	1
		Talitridae				
			<i>Hyalella azteca</i>		8	3
	Isopoda					
		Asellidae				
			<i>Caecidotea sp. (Asellus)</i>		8	5
	Decapoda					
		Astacidae				
			<i>Pacifasticus sp.</i>		6	3
MOLLUSCA						
	Gastropoda					
		Ancyclidae				
			<i>Ferrissia rivularis</i>		6	1
		Lymnaeidae				
			<i>Fossaria spp.</i>		6	3
			<i>Stagnicola sp.</i>		6	3
			<i>Fisherola nutalli</i>		3	1
		Physidae				
			<i>Physella sp.</i>		8	4
		Planorbidae				
			<i>Gyraulus sp.</i>		8	3
		Valvatidae				
			<i>Valvata humeralis</i>		3	1
	Pelecypoda					
		Sphaeriidae			8	3
TURBELLARIA					4	3
NEMATODA					5	5
NEMATOMORPHA					5	5
ACARI					5	5

CNIDARIA

Hydra sp.

8

3

APPENDIX B:

1995 Clark Fork Basin macroinvertebrate data

B.1 MACROINVERTEBRATE DATA								
Blacktail Creek above Grove Gulch - STATION SF-1 - 15 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						8%	214	
<i>Optioservus spp.</i>	97	120	71	25	313	3%	78.3	40.8
<i>Zaitzevia sp.</i>	21	25	14	0	60	1%	15.0	11.0
<i>Cleptelmis ornata</i>	95	63	226	20	404	4%	101.0	88.8
<i>Heterlimnius sp.</i>	0	6	1	1	8	0%	2.0	2.7
<i>Narpus concolor</i>	1	0	0	0	1	0%	0.3	0.5
<i>Agabus sp.</i>	1	2	1	0	4	0%	1.0	0.8
Hydrophilidae	0	0	1	0	1	0%	0.3	0.5
<i>Brychius sp.</i>	4	25	11	24	64	1%	16.0	10.2
<i>Halipus sp.</i>	0	1	1	0	2	0%	0.5	0.6
DIPTERA						63%	1623	
<i>Pagastia sp</i>	301	315	151	171	938	9%	234.5	85.5
<i>Brillia sp.</i>	1	1	0	0	2	0%	0.5	0.6
<i>Cardiocladius spp.</i>	5	30	2	0	37	0%	9.3	14.0
<i>Cricotopus spp.</i>	71	72	11	24	178	2%	44.5	31.6
<i>Eukiefferiella spp.</i>	13	10	2	0	25	0%	6.3	6.2
<i>Orthocladius spp.</i>	12	1	1	1	15	0%	3.8	5.5
<i>Parametriocnemus sp.</i>	32	138	26	25	221	2%	55.3	55.3
<i>Paraphaenocladius sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Tvetenia sp.</i>	175	622	172	119	1088	11%	272.0	234.7
<i>Phaenopsectra sp</i>	2	5	0	2	9	0%	2.3	2.1
<i>Rheotanytarsus sp.</i>	0	0	10	0	10	0%	2.5	5.0
<i>Micropsectra spp.</i>	3	15	0	11	29	0%	7.3	6.9
<i>Dicranota sp.</i>	7	17	17	6	47	0%	11.8	6.1
<i>Hexatoma sp.</i>	3	7	0	0	10	0%	2.5	3.3
<i>Tipula sp.</i>	0	6	0	1	7	0%	1.8	2.9
<i>Simulium (Eusimulium)</i>	685	2315	498	375	3873	38%	968.3	906.8
EPHEMEROPTERA						4%	93	
<i>Baetis tricaudatus</i>	52	131	40	74	297	3%	74.3	40.4
<i>Dipheter hageni</i>	0	10	1	22	33	0%	8.3	10.2
<i>Drunella grandis</i>	0	1	0	0	1	0%	0.3	0.5
<i>Nixe sp.</i>	4	14	1	8	27	0%	6.8	5.6
<i>Paraleptophlebia sp.</i>	2	0	1	6	9	0%	2.3	2.6
<i>Tricorythodes minutus</i>	0	1	0	2	3	0%	0.8	1.0
PLECOPTERA						2%	61	
<i>Malenka sp.</i>	0	0	0	2	2	0%	0.5	1.0
<i>Isoperla sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Pteronarcella badia</i>	62	76	72	21	231	2%	57.8	25.2
Chloroperlinae	2	5	1	1	9	0%	2.3	1.9

B.1 MACROINVERTEBRATE DATA								
Blacktail Creek above Grove Gulch - STATION SF-1 - 15 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TRICHOPTERA						21%	532	
<i>Cheumatopsyche</i> spp.	21	10	3	15	49	0%	12.3	7.6
<i>Hydropsyche oslari</i> ?	449	725	406	413	1993	19%	498.3	152.3
<i>Hydropsyche slossonae</i>	0	15	1	65	81	1%	20.3	30.6
<i>Hydroptila</i> spp.	0	2	2	0	4	0%	1.0	1.2
<i>Wormaldia</i> sp.	0	0	0	1	1	0%	0.3	0.5
ANNELIDA						2%	43	
Lumbricidae	1	2	0	0	3	0%	0.8	1.0
Naididae	14	120	5	23	162	2%	40.5	53.5
Tubificidae	3	5	0	0	8	0%	2.0	2.4
CRUSTACEA								
<i>Hyalella azteca</i>	1	0	0	1	2	0%	0.5	0.6
MOLLUSCA						0%	0	
<i>Gyraulus</i> sp.	0	1	0	0	1	0%	0.3	0.5
ID's by D. McGuire								
TOTAL ORGANISMS	2140	4915	1749	1460	10264		2566	1591
TAXA RICHNESS	30	37	29	29	45		31	3.9
SHAN. DIVERSITY	3.07	2.74	3.00	3.17	3.03		2.99	0.18
BIOTIC INDEX	3.97	4.46	3.94	3.87	4.19		4.06	0.27
EPT RICHNESS	7	12	10	12	15		10	2.4
% R.A. DOMINANT	32%	47%	28%	28%	38%		34%	8.9%
% R.A. FILTERERS	54%	62%	52%	60%	59%		57%	5%
METALS TOLERANCE	5.76	5.29	5.30	5.65	5.44		5.50	0.24
Baetidae/Ephemeroptera	0.90	0.90	0.95	0.86	0.89		0.90	0.04
Hydropsychinae/Trichoptera	1.00	1.00	1.00	1.00	1.00		1.00	0.00
EPT / (EPT + CHIR.)	0.49	0.45	0.58	0.64	0.52		0.54	0.09

B.2 MACROINVERTEBRATE DATA								
SILVER BOW CREEK above Butte WWTP - STATION 00 - 15 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						1%	2	
<i>Optioservus spp.</i>	1	2	2	0	5	0%	1.3	1.0
<i>Agabus sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Agabinus sp.</i>	0	0	1	0	1	0%	0.3	0.5
DIPTERA						99%	275	
<i>Thienemannimyia gp.</i>	0	0	1	0	1	0%	0.3	0.5
<i>Pagastia sp</i>	31	9	119	19	178	16%	44.5	50.5
<i>Cardiocladius spp.</i>	91	59	153	85	388	35%	97.0	39.8
<i>Cricotopus spp.</i>	143	60	191	77	471	42%	117.8	60.5
<i>Eukiefferiella spp.</i>	2	4	3	1	10	1%	2.5	1.3
<i>Orthocladius spp.</i>	11	8	7	9	35	3%	8.8	1.7
<i>Tvetenia sp.</i>	1	0	2	0	3	0%	0.8	1.0
<i>Dicranota sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Simulium (Eusimulium)</i>	1	1	1	1	4	0%	1.0	0.0
<i>Limnophora sp.</i>	3	0	0	2	5	0%	1.3	1.5
<i>Chelifera sp.</i>	1	0	1	0	2	0%	0.5	0.6
TRICHOPTERA						1%	2	
<i>Hydropsyche osleri ?</i>	3	0	4	0	7	1%	1.8	2.1
<i>Psychoglypha sp.</i>	0	0	1	0	1	0%	0.3	0.5
ID's by D. McGuire								
TOTAL ORGANISMS	289	143	486	195	1113		278	151
TAXA RICHNESS	12	7	13	8	16		10.0	2.9
SHAN. DIVERSITY	1.88	1.82	1.90	1.77	1.93		1.84	0.06
BIOTIC INDEX	5.60	5.73	4.81	5.47	5.25		5.40	0.41
EPT RICHNESS	1	0	2	0	2		0.8	1.0
% R.A. DOMINANT	49%	42%	39%	44%	42%		44%	4.3%
% R.A. FILTERERS	1%	1%	1%	1%	1%		1%	0%
METALS TOLERANCE	9.17	9.06	9.21	9.11	9.16		9.14	0.07
Baetidae/Ephemeroptera	1.00	1.00	1.00	1.00	1.00		1.00	0.00
Hydropsychinae/Trichoptera	1.00	1.00	0.80	1.00	0.88		0.95	0.10
EPT / (EPT + CHIR.)	0.01	0.00	0.01	0.00	0.01		0.01	0.01

B.3 MACROINVERTEBRATE DATA								
SILVER BOW CREEK below Colorado Tailings - STATION 01 - 15 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						1%	3	
<i>Optioservus spp.</i>	0	1	2	4	7	0%	1.8	1.7
<i>Agabus sp.</i>	0	0	0	4	4	0%	1.0	2.0
DIPTERA						92%	394	
<i>Thienemannimyia gp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Diamesa spp.</i>	0	0	1	2	3	0%	0.8	1.0
<i>Pagastia sp</i>	15	14	46	26	101	6%	25.3	14.9
<i>Cardiocladius spp.</i>	127	98	288	204	717	42%	179.3	85.2
<i>Cricotopus spp.</i>	63	106	252	229	650	38%	162.5	92.2
<i>Eukiefferiella spp.</i>	3	3	7	4	17	1%	4.3	1.9
<i>Nanocladius sp.</i>	0	0	1	1	2	0%	0.5	0.6
<i>Orthocladius spp.</i>	13	4	14	5	36	2%	9.0	5.2
<i>Tvetenia sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Chironomus sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Simulium (Psilozoa)</i>	5	3	26	10	44	3%	11.0	10.4
<i>Limnophora sp.</i>	0	0	1	1	2	0%	0.5	0.6
EPHEMEROPTERA						0%	0	
<i>Baetis tricaudatus</i>	1	0	0	0	1	0%	0.3	0.5
HEMIPTERA								
<i>Gerris sp.</i>	0	0	1	0	1	0%	0.3	0.5
ANNELIDA						7%	29	
Tubificidae	88	0	10	19	117	7%	29.3	39.9
ID's by D. McGuire								
TOTAL ORGANISMS	316	230	649	510	1705		426	189
TAXA RICHNESS	9	8	12	13	17		10.5	2.4
SHAN. DIVERSITY	2.12	1.62	1.87	1.87	2.01		1.87	0.20
BIOTIC INDEX	6.72	5.76	5.70	5.95	5.97		6.03	0.47
EPT RICHNESS	1	0	0	0	1		0.3	0.5
% R.A. DOMINANT	40%	46%	44%	45%	42%		44%	2.6%
% R.A. FILTERERS	2%	1%	4%	2%	3%		2%	1%
METALS TOLERANCE	8.11	9.31	9.12	9.18	8.98		8.93	0.55
Baetidae/Ephemeroptera	1.00	1.00	1.00	1.00	1.00		1.00	0.00
Hydropsychinae/Trichoptera	1.00	1.00	1.00	1.00	1.00		1.00	0.00
EPT / (EPT + CHIR.)	0.00	0.00	0.00	0.00	0.00		0.00	0.00

B.4 MACROINVERTEBRATE DATA								
SILVER BOW CREEK at Opportunity - STATION 02.5 - 15 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						3%	4	
<i>Optioservus spp.</i>	2	3	4	0	9	1%	2.3	1.7
<i>Agabus sp.</i>	0	2	0	0	2	0%	0.5	1.0
<i>Oreodytes spp.</i>	0	3	0	0	3	0%	0.8	1.5
Hydrophilidae	0	0	1	1	2	0%	0.5	0.6
DIPTERA						78%	122	
<i>Diamesa spp.</i>	1	1	0	0	2	0%	0.5	0.6
<i>Pagastia sp</i>	19	36	13	8	76	12%	19.0	12.2
<i>Cardiocladius spp.</i>	95	65	57	95	312	50%	78.0	19.9
<i>Cricotopus spp.</i>	3	20	5	8	36	6%	9.0	7.6
<i>Eukiefferiella spp.</i>	31	4	16	7	58	9%	14.5	12.1
<i>Orthocladius spp.</i>	0	1	0	1	2	0%	0.5	0.6
TRICHOPTERA						20%	31	
<i>Hydropsyche nr. morosa</i>	17	9	1	6	33	5%	8.3	6.7
<i>Hydropsyche oslari ?</i>	14	16	4	5	39	6%	9.8	6.1
<i>Brachycentrus americanus</i>	15	34	2	2	53	8%	13.3	15.1
ID's by D. McGuire								
TOTAL ORGANISMS	197	194	103	133	627		157	46
TAXA RICHNESS	9	12	9	9	13		9.8	1.5
SHAN. DIVERSITY	2.31	2.71	2.08	1.63	2.43		2.18	0.45
BIOTIC INDEX	4.67	3.66	4.90	4.91	4.45		4.54	0.59
EPT RICHNESS	3	3	3	3	3		3.0	0.0
% R.A. DOMINANT	48%	34%	55%	71%	50%		52%	16%
% R.A. FILTERERS	23%	30%	7%	10%	20%		18%	11%
METALS TOLERANCE	8.12	7.70	8.63	8.68	8.19		8.28	0.46
Baetidae/Ephemeroptera*	1.00	1.00	1.00	1.00	1.00		1.00	0.00
Hydropsychinae/Trichoptera	0.67	0.42	0.71	0.85	0.58		0.66	0.18
EPT / (EPT + CHIR.)	0.24	0.32	0.07	0.10	0.20		0.18	0.12

B.5 MACROINVERTEBRATE DATA								
SILVER BOW CREEK below Warm Springs Ponds - STATION 04.5 - 15 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						3%	102	
<i>Optioservus spp.</i>	78	220	33	75	406	3%	101.5	81.6
DIPTERA						25%	913	
<i>Thienemannimyia gp.</i>	10	1	0	0	11	0%	2.8	4.9
<i>Pentaneura sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Pagastia sp</i>	11	32	13	30	86	1%	21.5	11.0
<i>Potthastia longimanus gp.</i>	0	20	1	0	21	0%	5.3	9.8
<i>Cardiocladius spp.</i>	79	30	149	64	322	2%	80.5	50.1
<i>Cricotopus spp.</i>	502	635	813	433	2383	17%	595.8	167.3
<i>Eukiefferiella spp.</i>	1	35	79	67	182	1%	45.5	35.0
<i>Nanocladius sp.</i>	0	1	11	0	12	0%	3.0	5.4
<i>Orthocladius spp.</i>	3	64	42	11	120	1%	30.0	28.2
<i>Parametrioconemus sp.</i>	10	21	51	20	102	1%	25.5	17.7
<i>Tvetenia sp.</i>	41	12	23	20	96	1%	24.0	12.2
<i>Cryptochironomus sp.</i>	0	0	1	0	1	0%	0.3	0.5
<i>Microtendipes sp</i>	10	22	22	10	64	0%	16.0	6.9
<i>Parachironomus sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Polypedilum spp.</i>	54	43	43	8	148	1%	37.0	20.0
<i>Rheotanytarsus sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Micropsectra spp.</i>	3	1	0	0	4	0%	1.0	1.4
<i>Antocha sp.</i>	40	12	12	9	73	1%	18.3	14.6
<i>Dicranota sp.</i>	0	0	1	0	1	0%	0.3	0.5
<i>Hexatoma sp.</i>	8	1	1	5	15	0%	3.8	3.4
<i>Simulium spp.</i>	3	0	0	1	4	0%	1.0	1.4
<i>Hemerodromia sp.</i>	1	0	1	1	3	0%	0.8	0.5
EPHEMEROPTERA						6%	217	
<i>Baetis tricaudatus</i>	96	199	281	258	834	6%	208.5	82.6
<i>Baetis punctiventris</i>	0	0	10	10	20	0%	5.0	5.8
<i>Tricorythodes minutus</i>	0	10	2	0	12	0%	3.0	4.8
LEPIDOPTERA								
<i>Petrophila sp.</i>	0	0	1	0	1	0%	0.3	0.5
ODONATA								
<i>Ophiogomphus sp.</i>	0	0	1	0	1	0%	0.3	0.5

B.5 MACROINVERTEBRATE DATA								
SILVER BOW CREEK below Warm Springs Ponds - STATION 04.5 - 15 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TRICHOPTERA						64%	2321	
<i>Cheumatopsyche</i> spp.	42	89	102	37	270	2%	67.5	32.8
<i>Hydropsyche occidentalis</i>	932	1106	1547	1373	4958	34%	1239.5	273.7
<i>Ceratopsyche cockerelli</i>	0	0	2	0	2	0%	0.5	1.0
<i>Ceratopsyche</i> nr. <i>morosa</i>	524	679	1061	812	3076	21%	769.0	227.5
<i>Hydroptila</i> spp.	122	230	229	264	845	6%	211.3	61.7
<i>Ochrotrichia</i> sp.	11	51	44	23	129	1%	32.3	18.5
<i>Brachycentrus occidentalis</i>	0	0	1	0	1	0%	0.3	0.5
<i>Helicopsyche borealis</i>	0	1	0	0	1	0%	0.3	0.5
ANNELEIDA						0%	7	
Tubificidae	3	1	1	23	28	0%	7.0	10.7
CRUSTACEA								
<i>Hyalella azteca</i>	15	64	117	5	201	1%	50.3	51.4
MOLLUSCA						0%	0	
<i>Physella</i> sp.	1	0	0	0	1	0%	0.3	0.5
ID's by D. McGuire								
TOTAL ORGANISMS	2600	3582	4695	3560	14437		3609	856
TAXA RICHNESS	25	28	31	24	39		27.0	3.2
SHAN. DIVERSITY	2.83	3.08	2.92	2.72	2.95		2.89	0.15
BIOTIC INDEX	5.39	5.41	5.45	5.30	5.39		5.39	0.06
EPT RICHNESS	6	8	10	7	11		7.8	1.7
% R.A. DOMINANT	36%	31%	33%	39%	34%		35%	3.4%
% R.A. FILTERERS	58%	52%	58%	62%	58%		58%	4%
METALS TOLERANCE	6.16	6.00	6.13	5.90	6.05		6.05	0.12
Baetidae/Ephemeroptera	1.00	0.95	0.99	1.00	0.99		0.99	0.02
Hydropsychinae/Trichoptera	0.92	0.87	0.91	0.89	0.89		0.90	0.02
EPT / (EPT + CHIR.)	0.70	0.72	0.72	0.81	0.74		0.74	0.05

B.6 MACROINVERTEBRATE DATA								
WARM SPRINGS CREEK near mouth - STATION 06 - 15 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						7%	33	
<i>Optioservus spp.</i>	61	10	31	14	116	7%	29.0	23.2
<i>Zaitzevia sp.</i>	5	2	2	1	10	1%	2.5	1.7
<i>Cleptelmis ornata</i>	0	2	0	1	3	0%	0.8	1.0
<i>Oreodytes spp.</i>	0	1	0	0	1	0%	0.3	0.5
DIPTERA						68%	300	
<i>Pagastia sp</i>	68	14	50	23	155	9%	38.8	24.8
<i>Cardiocladius spp.</i>	11	13	4	4	32	2%	8.0	4.7
<i>Corynoneura sp</i>	0	0	2	0	2	0%	0.5	1.0
<i>Cricotopus spp.</i>	5	4	15	3	27	2%	6.8	5.6
<i>Cricotopus nostococladius</i>	0	0	3	0	3	0%	0.8	1.5
<i>Eukiefferiella spp.</i>	13	13	19	15	60	3%	15.0	2.8
<i>Orthocladius spp.</i>	3	3	6	2	14	1%	3.5	1.7
<i>Parametriocnemus sp.</i>	2	0	1	0	3	0%	0.8	1.0
<i>Tvetenia sp.</i>	96	38	29	12	175	10%	43.8	36.5
<i>Rheotanytarsus sp.</i>	0	0	1	1	2	0%	0.5	0.6
<i>Micropsectra spp.</i>	90	94	48	128	360	20%	90.0	32.8
<i>Antocha sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Hexatoma sp.</i>	11	6	13	5	35	2%	8.8	3.9
<i>Simulium (Eusimulium)</i>	60	170	57	29	316	18%	79.0	62.3
<i>Chelifera sp.</i>	10	1	4	1	16	1%	4.0	4.2
EPHEMEROPTERA						15%	66	
<i>Acentrella insignificans</i>	10	0	1	3	14	1%	3.5	4.5
<i>Baetis tricaudatus</i>	101	53	36	37	227	13%	56.8	30.5
<i>Dipheter hageni</i>	1	0	0	0	1	0%	0.3	0.5
<i>Serratella tibialis</i>	3	1	1	1	6	0%	1.5	1.0
<i>Drunella grandis</i>	1	0	4	1	6	0%	1.5	1.7
<i>Epeorus longimanus</i>	1	3	0	0	4	0%	1.0	1.4
<i>Heptagenia sp.</i>	3	0	0	1	4	0%	1.0	1.4
PLECOPTERA						4%	18	
<i>Hesperoperla pacifica</i>	6	6	2	2	16	1%	4.0	2.3
<i>Malenka sp.</i>	1	1	0	0	2	0%	0.5	0.6
<i>Skwala sp.</i>	4	5	5	5	19	1%	4.8	0.5
<i>Pteronarcella badia</i>	4	22	3	3	32	2%	8.0	9.3
Chloroperlinae	1	0	0	1	2	0%	0.5	0.6

B.6 MACROINVERTEBRATE DATA								
WARM SPRINGS CREEK near mouth - STATION 06 - 15 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TRICHOPTERA						5%	23	
<i>Arctopsyche grandis</i>	10	21	11	12	54	3%	13.5	5.1
<i>Hydropsyche (C.) spp.</i>	1	2	4	1	8	0%	2.0	1.4
<i>Hydroptila spp.</i>	2	2	12	2	18	1%	4.5	5.0
<i>Ochrotrichia sp.</i>	0	0	2	0	2	0%	0.5	1.0
<i>Wormaldia sp.</i>	1	0	1	0	2	0%	0.5	0.6
<i>Rhyacophila brunnea gp.</i>	2	0	1	0	3	0%	0.8	1.0
<i>Agapetus sp.</i>	0	0	3	0	3	0%	0.8	1.5
ANNELIDA						0%	1	
Enchytriadae	0	2	0	0	2	0%	0.5	1.0
CRUSTACEA								
<i>Hyalella azteca</i>	1	2	0	0	3	0%	0.8	1.0
MOLLUSCA						0%	1	
<i>Gyraulus sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Sphaeriidae</i>	1	1	0	1	3	0%	0.8	0.5
ID's by D. McGuire								
TOTAL ORGANISMS	589	493	371	310	1763		441	125
TAXA RICHNESS	32	28	30	28	42		29.5	1.9
SHAN. DIVERSITY	3.57	3.22	3.92	3.17	3.68		3.47	0.35
BIOTIC INDEX	4.07	4.34	4.18	4.08	4.17		4.17	0.12
EPT RICHNESS	17	10	14	12	19		13.3	3.0
% R.A. DOMINANT	17%	34%	15%	41%	20%		27%	13%
% R.A. FILTERERS	12%	39%	20%	14%	22%		21%	12%
METALS TOLERANCE	4.59	4.15	4.96	3.55	4.36		4.31	0.61
Baetidae/Ephemeroptera	0.93	0.93	0.88	0.93	0.92		0.92	0.03
Hydropsychinae/Trichoptera	0.06	0.08	0.12	0.07	0.09		0.08	0.03
EPT / (EPT + CHIR.)	0.35	0.39	0.33	0.27	0.34		0.33	0.05

B.7 MACROINVERTEBRATE DATA								
CLARK FORK RIVER blw Warm Springs Creek - STATION 07 - 15 AUG 95								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						19%	416	
<i>Optioservus spp.</i>	336	558	218	300	1412	16%	353.0	145.3
<i>Zaitzevia sp.</i>	43	75	26	37	181	2%	45.3	21.0
<i>Cleptelmis ornata</i>	13	3	32	21	69	1%	17.3	12.3
<i>Lara sp.</i>	0	0	1	0	1	0%	0.3	0.5
DIPTERA						27%	589	
<i>Thienemannimyia gp.</i>	0	0	1	1	2	0%	0.5	0.6
<i>Pagastia sp</i>	234	232	219	134	819	10%	204.8	47.6
<i>Cardiocladius spp.</i>	25	6	6	2	39	0%	9.8	10.3
<i>Cricotopus spp.</i>	445	238	210	96	989	11%	247.3	145.4
<i>Cricotopus nostococladius</i>	0	1	2	2	5	0%	1.3	1.0
<i>Eukiefferiella spp.</i>	41	25	13	14	93	1%	23.3	13.0
<i>Orthocladius spp.</i>	24	31	26	7	88	1%	22.0	10.4
<i>Parametriocnemus sp.</i>	0	11	2	2	15	0%	3.8	4.9
<i>Tvetenia sp.</i>	23	6	20	19	68	1%	17.0	7.5
<i>Microtendipes sp</i>	1	1	6	12	20	0%	5.0	5.2
<i>Polypedilum spp.</i>	11	0	0	2	13	0%	3.3	5.3
<i>Rheotanytarsus sp.</i>	0	1	0	5	6	0%	1.5	2.4
<i>Tanytarsus sp.</i>	0	2	0	0	2	0%	0.5	1.0
<i>Micropsectra spp.</i>	33	30	27	16	106	1%	26.5	7.4
<i>Antocha sp.</i>	4	8	28	16	56	1%	14.0	10.6
<i>Dicranota sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Hexatoma sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Tipula sp.</i>	0	0	1	0	1	0%	0.3	0.5
<i>Simulium (Psilozoa)</i>	0	1	21	11	33	0%	8.3	9.8
EPHEMEROPTERA						4%	96	
<i>Acentrella insignificans</i>	1	0	0	0	1	0%	0.3	0.5
<i>Baetis tricaudatus</i>	45	102	70	85	302	4%	75.5	24.2
<i>Baetis punctiventris</i>	1	0	2	0	3	0%	0.8	1.0
<i>Attenella margarita</i>	1	1	0	0	2	0%	0.5	0.6
<i>Drunella grandis</i>	9	30	17	6	62	1%	15.5	10.7
<i>Nixe sp.</i>	0	1	0	1	2	0%	0.5	0.6
<i>Paraleptophlebia sp.</i>	0	2	0	1	3	0%	0.8	1.0
<i>Tricorythodes minutus</i>	6	0	1	1	8	0%	2.0	2.7
PLECOPTERA						4%	80	
<i>Hesperoperla pacifica</i>	4	0	6	5	15	0%	3.8	2.6
<i>Malenka sp.</i>	1	5	0	9	15	0%	3.8	4.1
<i>Skwala sp.</i>	6	3	1	4	14	0%	3.5	2.1
<i>Pteronarcella badia</i>	48	63	53	110	274	3%	68.5	28.4

B.7 MACROINVERTEBRATE DATA								
CLARK FORK RIVER blw Warm Springs Creek - STATION 07 - 15 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TRICHOPTERA						36%	772	
<i>Cheumatopsyche</i> spp.	11	6	10	22	49	1%	12.3	6.8
<i>Hydropsyche occidentalis</i>	405	446	447	469	1767	21%	441.8	26.7
<i>Hydropsyche cockerelli</i>	0	3	0	1	4	0%	1.0	1.4
<i>Hydropsyche</i> nr. <i>morosa</i>	139	87	66	96	388	5%	97.0	30.7
<i>Hydroptila</i> spp.	196	233	164	105	698	8%	174.5	54.2
<i>Ochrotrichia</i> sp.	10	10	5	16	41	0%	10.3	4.5
<i>Brachycentrus occidentalis</i>	0	0	0	1	1	0%	0.3	0.5
<i>Rhyacophila brunnea</i> gp.	1	1	1	5	8	0%	2.0	2.0
<i>Helicopsyche borealis</i>	90	8	17	15	130	2%	32.5	38.5
ANNELIDA						0%	7	
Tubificidae	21	5	0	0	26	0%	6.5	9.9
CRUSTACEA								
<i>Hyalella azteca</i>	345	162	171	94	772	9%	193.0	107.0
MOLLUSCA						0%	1	
<i>Gyraulus</i> sp.	1	0	0	1	2	0%	0.5	0.6
ID's by D. McGuire								
TOTAL ORGANISMS	2574	2398	1890	1745	8607		2152	397
TAXA RICHNESS	33	36	33	39	47		35.3	2.9
SHAN. DIVERSITY	3.62	3.47	3.64	3.65	3.68		3.60	0.08
BIOTIC INDEX	5.37	4.95	4.94	4.75	5.04		5.01	0.26
EPT RICHNESS	17	16	14	18	21		16.3	1.7
% R.A. DOMINANT	17%	23%	24%	27%	21%		23%	4.0%
% R.A. FILTERERS	22%	23%	29%	35%	26%		27%	6%
METALS TOLERANCE	5.88	5.57	5.65	5.28	5.62		5.59	0.25
Baetidae/Ephemeroptera	0.75	0.75	0.80	0.90	0.80		0.80	0.07
Hydropsychinae/Trichoptera	0.65	0.68	0.74	0.81	0.72		0.72	0.07
EPT / (EPT + CHIR.)	0.54	0.63	0.62	0.75	0.63		0.64	0.09

B.8 MACROINVERTEBRATE DATA								
CLARK FORK RIVER @ Deer Lodge - STATION 09 - 16 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						2%	51	
<i>Optioservus spp.</i>	54	17	17	41	129	2%	32.3	18.4
<i>Zaitzevia sp.</i>	21	12	20	21	74	1%	18.5	4.4
DIPTERA						50%	1069	
<i>Pagastia sp</i>	11	3	1	5	20	0%	5.0	4.3
<i>Cardiocladius spp.</i>	48	77	91	35	251	3%	62.8	25.7
<i>Cricotopus spp.</i>	109	86	187	69	451	5%	112.8	52.1
<i>Eukiefferiella spp.</i>	69	124	120	134	447	5%	111.8	29.1
<i>Orthocladius spp.</i>	4	12	2	0	18	0%	4.5	5.3
<i>Parametriocnemus sp.</i>	12	0	25	11	48	1%	12.0	10.2
<i>Tvetenia sp.</i>	18	39	57	42	156	2%	39.0	16.1
<i>Microtendipes sp</i>	1	0	0	0	1	0%	0.3	0.5
<i>Paracladopelma sp.</i>	0	0	1	0	1	0%	0.3	0.5
<i>Polypedilum spp.</i>	65	30	86	61	242	3%	60.5	23.1
<i>Micropsectra spp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Antocha sp.</i>	22	13	5	20	60	1%	15.0	7.7
<i>Tipula sp.</i>	1	0	1	1	3	0%	0.8	0.5
Ceratopogoninae	0	1	0	0	1	0%	0.3	0.5
<i>Simulium spp.</i>	674	758	695	447	2574	30%	643.5	135.8
EPHEMEROPTERA						4%	83	
<i>Baetis tricaudatus</i>	135	53	70	57	315	4%	78.8	38.2
<i>Attenella margarita</i>	6	0	0	0	6	0%	1.5	3.0
<i>Tricorythodes minutus</i>	8	0	1	0	9	0%	2.3	3.9
ODONATA								
<i>Ophiogomphus sp.</i>	1	0	0	0	1	0%	0.3	0.5
PLECOPTERA						1%	29	
<i>Isogenoides sp.</i>	18	9	20	16	63	1%	15.8	4.8
<i>Skwala sp.</i>	12	8	9	6	35	0%	8.8	2.5
<i>Pteronarcella badia</i>	8	1	3	3	15	0%	3.8	3.0
Kathroperlinae	1	0	0	0	1	0%	0.3	0.5

B.8 MACROINVERTEBRATE DATA								
CLARK FORK RIVER @ Deer Lodge - STATION 09 - 16 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TRICHOPTERA						42%	903	
<i>Arctopsyche grandis</i>	0	1	0	0	1	0%	0.3	0.5
<i>Cheumatopsyche spp.</i>	16	0	6	0	22	0%	5.5	7.5
<i>Hydropsyche occidentalis</i>	745	751	796	1026	3318	39%	829.5	133.0
<i>Hydropsyche cockerelli</i>	1	0	0	0	1	0%	0.3	0.5
<i>Hydropsyche nr. morosa</i>	18	15	40	48	121	1%	30.3	16.3
<i>Hydroptila spp.</i>	11	28	11	26	76	1%	19.0	9.3
<i>Neotrichia sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Ochrotrichia sp.</i>	11	2	12	33	58	1%	14.5	13.1
<i>Oecetis sp.</i>	0	0	1	0	1	0%	0.3	0.5
<i>Brachycentrus occidentalis</i>	1	1	0	0	2	0%	0.5	0.6
<i>Glossosoma sp.</i>	2	3	6	1	12	0%	3.0	2.2
ANNELIDA						0%	2	
Lumbricidae	0	0	0	1	1	0%	0.3	0.5
Tubificidae	5	0	0	0	5	0%	1.3	2.5
ID's by D. McGuire								
TOTAL ORGANISMS	2110	2044	2283	2104	8541		2135	103
TAXA RICHNESS	33	23	26	22	38		26.0	5.0
SHAN. DIVERSITY	2.85	2.46	2.79	2.60	2.74		2.67	0.18
BIOTIC INDEX	5.39	5.59	5.58	5.40	5.49		5.49	0.11
EPT RICHNESS	16	11	12	9	18		12.0	2.9
% R.A. DOMINANT	35%	37%	35%	49%	39%		39%	6.6%
% R.A. FILTERERS	69%	75%	67%	72%	71%		71%	3%
METALS TOLERANCE	5.69	5.90	5.97	5.59	5.79		5.79	0.18
Baetidae/Ephemeroptera	0.91	1.00	0.99	1.00	0.95		0.97	0.05
Hydropsychinae/Trichoptera	0.97	0.96	0.97	0.95	0.96		0.96	0.01
EPT / (EPT + CHIR.)	0.75	0.70	0.63	0.77	0.71		0.71	0.06

B.9 MACROINVERTEBRATE DATA								
CLARK FORK RIVER above Little Blackfoot River - STATION 10 - 16 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						2%	54	
<i>Optioservus spp.</i>	17	70	15	20	122	1%	30.5	26.4
<i>Zaitzevia sp.</i>	20	39	21	13	93	1%	23.3	11.1
DIPTERA						47%	1402	
<i>Thienemannimyia gp.</i>	33	5	21	7	66	1%	16.5	13.1
<i>Pentaneura sp.</i>	41	14	6	1	62	1%	15.5	17.8
<i>Pagastia sp</i>	0	1	0	4	5	0%	1.3	1.9
<i>Cardiocladius spp.</i>	14	17	31	10	72	1%	18.0	9.1
<i>Corynoneura sp</i>	0	0	5	0	5	0%	1.3	2.5
<i>Cricotopus spp.</i>	407	137	510	190	1244	10%	311.0	176.8
<i>Eukiefferiella spp.</i>	27	41	65	118	251	2%	62.8	40.0
<i>Nanocladius sp.</i>	2	0	1	0	3	0%	0.8	1.0
<i>Orthocladius spp.</i>	22	7	5	35	69	1%	17.3	14.1
<i>Parametriocnemus sp.</i>	65	14	16	11	106	1%	26.5	25.7
<i>Tvetenia sp.</i>	155	95	68	105	423	4%	105.8	36.4
<i>Microtendipes sp</i>	1	6	13	9	29	0%	7.3	5.1
<i>Polypedilum spp.</i>	299	195	314	147	955	8%	238.8	80.9
<i>Micropsectra spp.</i>	6	11	0	0	17	0%	4.3	5.3
<i>Antocha sp.</i>	11	18	2	2	33	0%	8.3	7.8
<i>Dicranota sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Hexatoma sp.</i>	10	5	16	9	40	0%	10.0	4.5
<i>Simulium spp.</i>	445	288	837	655	2225	19%	556.3	240.1
EPHEMEROPTERA						13%	397	
<i>Acentrella insignificans</i>	10	12	6	0	28	0%	7.0	5.3
<i>Baetis tricaudatus</i>	250	86	143	47	526	4%	131.5	88.3
<i>Baetis punctiventris</i>	5	0	7	0	12	0%	3.0	3.6
<i>Attenella margarita</i>	4	1	5	3	13	0%	3.3	1.7
<i>Ephemerella inermis</i>	0	6	2	0	8	0%	2.0	2.8
<i>Tricorythodes minutus</i>	443	157	336	65	1001	8%	250.3	170.8
PLECOPTERA						1%	22	
<i>Amphinemura sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Isogenoides sp.</i>	14	32	14	15	75	1%	18.8	8.8
<i>Skwala sp.</i>	3	0	1	1	5	0%	1.3	1.3
<i>Isoperla fulva</i>	1	0	0	0	1	0%	0.3	0.5
<i>Pteronarcella badia</i>	1	1	1	1	4	0%	1.0	0.0
Kathroperlinae	0	1	0	0	1	0%	0.3	0.5

B.9 MACROINVERTEBRATE DATA								
CLARK FORK RIVER above Little Blackfoot River - STATION 10 - 16 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TRICHOPTERA						37%	1126	
<i>Arctopsyche grandis</i>	2	0	0	1	3	0%	0.8	1.0
<i>Cheumatopsyche spp.</i>	29	28	23	12	92	1%	23.0	7.8
<i>Hydropsyche occidentalis</i>	1027	983	1269	827	4106	34%	1026.5	183.0
<i>Hydropsyche cockerelli</i>	0	0	0	2	2	0%	0.5	1.0
<i>Hydropsyche nr. morosa</i>	11	6	6	7	30	0%	7.5	2.4
<i>Hydroptila spp.</i>	11	17	5	22	55	0%	13.8	7.4
<i>Neotrichia sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Ochrotrichia sp.</i>	45	36	28	15	124	1%	31.0	12.7
<i>Brachycentrus occidentalis</i>	18	34	22	8	82	1%	20.5	10.8
<i>Protophila sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Glossosoma sp.</i>	0	6	0	1	7	0%	1.8	2.9
ANNELIDA						0%	6	
Tubificidae	15	2	5	0	22	0%	5.5	6.7
CRUSTACEA								
<i>Hyaella azteca</i>	1	1	0	0	2	0%	0.5	0.6
ID's by D. McGuire								
TOTAL ORGANISMS	3467	2373	3819	2364	12023		3006	750
TAXA RICHNESS	37	35	33	32	45		34.3	2.2
SHAN. DIVERSITY	3.34	3.24	2.96	2.92	3.20		3.11	0.21
BIOTIC INDEX	5.25	5.14	5.46	5.57	5.35		5.35	0.19
EPT RICHNESS	18	16	15	15	23		16.0	1.4
% R.A. DOMINANT	30%	41%	33%	35%	34%		35%	4.9%
% R.A. FILTERERS	44%	56%	56%	64%	54%		55%	8%
METALS TOLERANCE	5.34	5.13	5.71	5.67	5.48		5.46	0.28
Baetidae/Ephemeroptera	0.37	0.37	0.31	0.41	0.36		0.37	0.04
Hydropsychinae/Trichoptera	0.93	0.92	0.96	0.95	0.94		0.94	0.02
EPT / (EPT + CHIR.)	0.64	0.72	0.64	0.62	0.65		0.65	0.05

B.10 MACROINVERTEBRATE DATA								
LITTLE BLACKFOOT RIVER near mouth - STATION 10.2 - 16 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						10%	94	
<i>Optioservus</i> spp.	79	48	144	27	298	8%	74.5	51.0
<i>Zaitzevia</i> sp.	12	25	19	21	77	2%	19.3	5.4
DIPTERA						57%	518	
<i>Thienemannimyia</i> gp.	2	0	0	0	2	0%	0.5	1.0
<i>Pentaneura</i> sp.	1	0	0	0	1	0%	0.3	0.5
<i>Pagastia</i> sp	11	8	18	5	42	1%	10.5	5.6
<i>Cardiocladius</i> spp.	21	39	2	5	67	2%	16.8	17.0
<i>Cricotopus</i> spp.	42	4	10	2	58	2%	14.5	18.6
<i>Cricotopus nostococladius</i>	0	18	56	5	79	2%	19.8	25.3
<i>Eukiefferiella</i> spp.	104	38	40	12	194	5%	48.5	39.1
<i>Orthocladius</i> spp.	14	10	12	7	43	1%	10.8	3.0
<i>Parametriocnemus</i> sp.	2	9	0	0	11	0%	2.8	4.3
<i>Tvetenia</i> sp.	76	17	28	15	136	4%	34.0	28.6
<i>Polypedilum</i> spp.	88	34	13	18	153	4%	38.3	34.4
<i>Robackia</i> sp.	0	0	1	0	1	0%	0.3	0.5
<i>Rheotanytarsus</i> sp.	17	0	20	12	49	1%	12.3	8.8
<i>Tanytarsus</i> sp.	2	0	0	0	2	0%	0.5	1.0
<i>Micropsectra</i> spp.	93	47	38	18	196	5%	49.0	31.7
<i>Antocha</i> sp.	36	27	95	50	208	6%	52.0	30.2
<i>Hexatoma</i> sp.	1	3	5	2	11	0%	2.8	1.7
<i>Atherix pachypus</i>	0	0	1	0	1	0%	0.3	0.5
<i>Simulium</i> (<i>Eusimulium</i>)	377	357	21	53	808	22%	202.0	191.1
<i>Chelifera</i> sp.	2	0	5	1	8	0%	2.0	2.2
EPHEMEROPTERA						17%	157	
<i>Acentrella insignificans</i>	31	27	59	17	134	4%	33.5	18.0
<i>Baetis tricaudatus</i>	62	85	31	33	211	6%	52.8	25.7
<i>Attenella margarita</i>	30	1	46	10	87	2%	21.8	20.2
<i>Serratella tibialis</i>	42	21	31	25	119	3%	29.8	9.1
<i>Drunella grandis</i>	5	1	7	3	16	0%	4.0	2.6
<i>Epeorus albertae</i>	0	0	1	1	2	0%	0.5	0.6
<i>Nixe</i> sp.	12	0	10	7	29	1%	7.3	5.3
<i>Tricorythodes minutus</i>	19	0	10	1	30	1%	7.5	8.9

B.10 MACROINVERTEBRATE DATA								
LITTLE BLACKFOOT RIVER near mouth - STATION 10.2 - 16 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
PLECOPTERA						3%	24	
<i>Claassenia sabulosa</i>	0	3	1	4	8	0%	2.0	1.8
<i>Hesperoperla pacifica</i>	1	2	7	2	12	0%	3.0	2.7
<i>Skwala sp.</i>	3	2	4	4	13	0%	3.3	1.0
<i>Pteronarcella badia</i>	11	0	12	1	24	1%	6.0	6.4
<i>Pteronarcys californica</i>	0	5	16	1	22	1%	5.5	7.3
Chloroperlinae	9	2	2	4	17	0%	4.3	3.3
TRICHOPTERA						11%	103	
<i>Arctopsyche grandis</i>	32	21	17	15	85	2%	21.3	7.6
<i>Hydropsyche occidentalis</i>	1	1	4	3	9	0%	2.3	1.5
<i>Hydropsyche cockerelli</i>	5	12	14	8	39	1%	9.8	4.0
<i>Hydropsyche oslari</i> ?	21	38	36	9	104	3%	26.0	13.6
<i>Limnephilus sp.</i>	0	0	1	0	1	0%	0.3	0.5
<i>Neophylax sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Hydroptila spp.</i>	10	1	20	10	41	1%	10.3	7.8
<i>Ochrotrichia sp.</i>	1	0	3	0	4	0%	1.0	1.4
<i>Lepidostoma sp.</i>	1	1	1	0	3	0%	0.8	0.5
<i>Brachycentrus occidentalis</i>	20	6	54	12	92	3%	23.0	21.4
<i>Rhyacophila sp.</i>	5	5	1	3	14	0%	3.5	1.9
<i>Helicopsyche borealis</i>	0	0	11	0	11	0%	2.8	5.5
<i>Glossosoma sp.</i>	0	3	3	1	7	0%	1.8	1.5
ANNELIDA						1%	11	
Enchytriadae	3	17	4	15	39	1%	9.8	7.3
Naididae	3	0	0	0	3	0%	0.8	1.5
CRUSTACEA								
<i>Hyaella azteca</i>	0	0	1	1	2	0%	0.5	0.6
ID's by D. McGuire								
TOTAL ORGANISMS	1308	938	935	443	3624		906	355
TAXA RICHNESS	42	35	46	40	52		40.8	4.6
SHAN. DIVERSITY	4.01	3.64	4.61	4.61	4.43		4.22	0.48
BIOTIC INDEX	4.76	4.54	4.08	4.05	4.44		4.36	0.35
EPT RICHNESS	21	19	26	22	27		22.0	2.9
% R.A. DOMINANT	29%	38%	15%	12%	22%		24%	12%
% R.A. FILTERERS	36%	46%	18%	25%	33%		31%	13%
METALS TOLERANCE	4.61	4.74	4.12	3.88	4.43		4.34	0.41
Baetidae/Ephemeroptera	0.46	0.83	0.46	0.52	0.55		0.57	0.18
Hydropsychinae/Trichoptera	0.28	0.58	0.33	0.33	0.37		0.38	0.14
EPT / (EPT + CHIR.)	0.41	0.51	0.63	0.64	0.52		0.55	0.11

B.11 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Gold Creek Bridge - STATION 11 - 16 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						10%	90	
<i>Optioservus spp.</i>	43	13	29	45	130	4%	32.5	14.8
<i>Zaitzevia sp.</i>	49	56	57	67	229	6%	57.3	7.4
DIPTERA						34%	305	
<i>Thienemannimyia gp.</i>	2	0	1	1	4	0%	1.0	0.8
<i>Pentaneura sp.</i>	0	2	3	6	11	0%	2.8	2.5
<i>Pagastia sp</i>	2	7	3	2	14	0%	3.5	2.4
<i>Cardiocladius spp.</i>	0	3	2	6	11	0%	2.8	2.5
<i>Corynoneura sp</i>	0	0	1	0	1	0%	0.3	0.5
<i>Cricotopus spp.</i>	10	3	120	86	219	6%	54.8	57.5
<i>Eukiefferiella spp.</i>	5	4	4	11	24	1%	6.0	3.4
<i>Orthocladius spp.</i>	5	10	14	62	91	3%	22.8	26.4
<i>Parametriocnemus sp.</i>	1	8	0	12	21	1%	5.3	5.7
<i>Tvetenia sp.</i>	12	42	18	65	137	4%	34.3	24.3
<i>Microtendipes sp</i>	1	2	0	2	5	0%	1.3	1.0
<i>Polypedilum spp.</i>	22	50	35	155	262	7%	65.5	60.8
<i>Tanytarsus sp.</i>	1	0	1	0	2	0%	0.5	0.6
<i>Micropsectra spp.</i>	3	3	3	1	10	0%	2.5	1.0
<i>Antocha sp.</i>	1	0	1	2	4	0%	1.0	0.8
<i>Hexatoma sp.</i>	10	7	10	2	29	1%	7.3	3.8
<i>Atherix pachypus</i>	0	5	1	0	6	0%	1.5	2.4
<i>Simulium (Psilozoa)</i>	34	21	54	259	368	10%	92.0	112.2
EPHEMEROPTERA						7%	65	
<i>Acentrella insignificans</i>	7	1	3	4	15	0%	3.8	2.5
<i>Baetis tricaudatus</i>	19	10	38	80	147	4%	36.8	31.1
<i>Attenella margarita</i>	9	1	10	1	21	1%	5.3	4.9
<i>Nixe sp.</i>	0	1	0	1	2	0%	0.5	0.6
<i>Rhithrogena sp.</i>	1	0	1	3	5	0%	1.3	1.3
<i>Tricorythodes minutus</i>	4	8	21	37	70	2%	17.5	14.9
HEMIPTERA								
Corixidae	0	1	0	0	1	0%	0.3	0.5
ODONATA								
<i>Ophiogomphus sp.</i>	0	0	1	0	1	0%	0.3	0.5

B.11 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Gold Creek Bridge - STATION 11 - 16 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
PLECOPTERA						3%	31	
<i>Claassenia sabulosa</i>	1	0	3	5	9	0%	2.3	2.2
<i>Hesperoperla pacifica</i>	1	1	0	1	3	0%	0.8	0.5
<i>Isogenoides sp.</i>	37	9	34	20	100	3%	25.0	13.0
<i>Skwala sp.</i>	3	0	0	2	5	0%	1.3	1.5
<i>Isoperla fulva</i>	0	0	2	1	3	0%	0.8	1.0
<i>Pteronarcella badia</i>	0	0	0	1	1	0%	0.3	0.5
Kathroperlinae	1	1	0	0	2	0%	0.5	0.6
Chloroperlinae	0	1	0	0	1	0%	0.3	0.5
TRICHOPTERA						46%	414	
<i>Arctopsyche grandis</i>	6	24	4	12	46	1%	11.5	9.0
<i>Cheumatopsyche spp.</i>	47	55	44	69	215	6%	53.8	11.2
<i>Hydropsyche occidentalis</i>	176	317	167	483	1143	32%	285.8	148.4
<i>Hydropsyche cockerelli</i>	12	23	20	45	100	3%	25.0	14.1
<i>Hydropsyche nr. morosa</i>	5	4	2	12	23	1%	5.8	4.3
<i>Hydroptila spp.</i>	4	4	7	17	32	1%	8.0	6.2
<i>Ochrotrichia sp.</i>	6	3	4	47	60	2%	15.0	21.4
<i>Brachycentrus occidentalis</i>	4	0	6	20	30	1%	7.5	8.7
<i>Rhyacophila sp.</i>	1	0	0	1	2	0%	0.5	0.6
<i>Helicopsyche borealis</i>	2	0	0	0	2	0%	0.5	1.0
<i>Glossosoma sp.</i>	0	1	0	3	4	0%	1.0	1.4
CRUSTACEA								
<i>Hyalella azteca</i>	0	1	0	0	1	0%	0.3	0.5
OTHER								
Turbellaria	2	0	0	0	2	0%	0.5	1.0
ID's by D. McGuire								
TOTAL ORGANISMS	549	702	724	1649	3624		906	501
TAXA RICHNESS	37	35	35	39	49		36.5	1.9
SHAN. DIVERSITY	3.75	3.21	3.84	3.66	3.79		3.62	0.28
BIOTIC INDEX	4.71	4.79	5.13	5.29	5.07		4.98	0.27
EPT RICHNESS	20	17	16	22	25		18.8	2.8
% R.A. DOMINANT	32%	45%	23%	29%	32%		32%	9.3%
% R.A. FILTERERS	52%	63%	41%	55%	53%		53%	9%
METALS TOLERANCE	4.69	4.68	5.53	5.19	5.08		5.02	0.42
Baetidae/Ephemeroptera	0.65	0.52	0.56	0.67	0.62		0.60	0.07
Hydropsychinae/Trichoptera	0.91	0.93	0.92	0.86	0.89		0.90	0.03
EPT / (EPT + CHIR.)	0.84	0.78	0.64	0.68	0.72		0.73	0.09

B.12 MACROINVERTEBRATE DATA								
FLINT CREEK at New Chicago - STATION 11.5 - 16 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						8%	116	
<i>Optioservus spp.</i>	75	77	204	97	453	8%	113.3	61.3
<i>Zaitzevia sp.</i>	0	0	7	2	9	0%	2.3	3.3
DIPTERA						30%	445	
<i>Thienemannimyia gp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Pagastia sp</i>	27	48	160	94	329	5%	82.3	58.9
<i>Cardiocladius spp.</i>	15	8	8	1	32	1%	8.0	5.7
<i>Cricotopus spp.</i>	46	36	180	30	292	5%	73.0	71.6
<i>Cricotopus nostococladius</i>	0	1	0	0	1	0%	0.3	0.5
<i>Eukiefferiella spp.</i>	31	13	49	11	104	2%	26.0	17.8
<i>Orthocladius spp.</i>	24	33	75	35	167	3%	41.8	22.7
<i>Parametriocnemus sp.</i>	5	0	7	3	15	0%	3.8	3.0
<i>Paraphaenocladius sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Tvetenia sp.</i>	23	17	26	59	125	2%	31.3	18.9
<i>Microtendipes sp</i>	0	5	8	0	13	0%	3.3	3.9
<i>Polypedilum spp.</i>	25	9	11	32	77	1%	19.3	11.1
<i>Micropsectra spp.</i>	97	48	78	137	360	6%	90.0	37.3
<i>Antocha sp.</i>	9	14	50	30	103	2%	25.8	18.5
<i>Hexatoma sp.</i>	3	0	0	0	3	0%	0.8	1.5
<i>Simulium (Eusimulium)</i>	122	18	0	15	155	3%	38.8	56.1
EPHEMEROPTERA						6%	91	
<i>Acentrella insignificans</i>	1	15	1	5	22	0%	5.5	6.6
<i>Baetis tricaudatus</i>	87	47	44	49	227	4%	56.8	20.3
<i>Attenella margarita</i>	0	0	1	3	4	0%	1.0	1.4
<i>Serratella tibialis</i>	1	2	1	0	4	0%	1.0	0.8
<i>Drunella grandis</i>	1	8	6	2	17	0%	4.3	3.3
<i>Heptagenia sp.</i>	0	0	4	1	5	0%	1.3	1.9
<i>Rhithrogena sp.</i>	0	0	0	3	3	0%	0.8	1.5
<i>Tricorythodes minutus</i>	6	8	29	39	82	1%	20.5	16.1
PLECOPTERA						4%	67	
<i>Claassenia sabulosa</i>	0	0	1	0	1	0%	0.3	0.5
<i>Hesperoperla pacifica</i>	0	2	3	3	8	0%	2.0	1.4
<i>Amphinemura sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Isogenoides sp.</i>	7	8	2	7	24	0%	6.0	2.7
<i>Skwala sp.</i>	32	51	40	39	162	3%	40.5	7.9
<i>Isoperla fulva</i>	0	1	1	0	2	0%	0.5	0.6
<i>Pteronarcella badia</i>	10	4	8	9	31	1%	7.8	2.6
<i>Pteronarcys californica</i>	3	8	13	16	40	1%	10.0	5.7

B.12 MACROINVERTEBRATE DATA								
FLINT CREEK at New Chicago - STATION 11.5 - 16 AUG 95								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TRICHOPTERA						49%	736	
<i>Arctopsyche grandis</i>	98	105	70	85	358	6%	89.5	15.4
<i>Cheumatopsyche spp.</i>	8	2	6	4	20	0%	5.0	2.6
<i>Hydropsyche occidentalis</i>	389	122	195	442	1148	19%	287.0	152.9
<i>Hydropsyche nr morosa</i>	60	53	80	104	297	5%	74.3	22.9
<i>Hydropsyche slossonae</i>	2	0	0	1	3	0%	0.8	1.0
<i>Neophylax sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Hydroptila spp.</i>	0	0	6	5	11	0%	2.8	3.2
<i>Ochrotrichia sp.</i>	5	0	0	0	5	0%	1.3	2.5
<i>Brachycentrus occidentalis</i>	44	440	238	372	1094	18%	273.5	174.5
<i>Glossosoma sp.</i>	1	3	1	3	8	0%	2.0	1.2
ANNELIDA						3%	46	
Lumbricidae	0	1	2	2	5	0%	1.3	1.0
Tubificidae	26	5	89	58	178	3%	44.5	36.8
CRUSTACEA								
<i>Caecidotea sp.</i>	0	0	1	0	1	0%	0.3	0.5
ID's by D. McGuire								
TOTAL ORGANISMS	1284	1213	1705	1800	6002		1501	295
TAXA RICHNESS	32	33	37	37	47		34.8	2.6
SHAN. DIVERSITY	3.73	3.54	4.02	3.70	3.97		3.75	0.20
BIOTIC INDEX	4.67	3.44	4.58	4.11	4.23		4.20	0.56
EPT RICHNESS	18	17	21	21	26		19.3	2.1
% R.A. DOMINANT	30%	36%	14%	25%	19%		26%	9.5%
% R.A. FILTERERS	56%	61%	35%	57%	51%		52%	12%
METALS TOLERANCE	4.57	3.89	5.22	4.20	4.51		4.47	0.57
Baetidae/Ephemeroptera	0.92	0.78	0.52	0.53	0.68		0.69	0.19
Hydropsychinae/Trichoptera	0.76	0.24	0.47	0.54	0.50		0.50	0.21
EPT / (EPT + CHIR.)	0.72	0.80	0.55	0.75	0.70		0.71	0.11

B.13 M A C R O I N V E R T E B R A T E D A T A								
CLARK FORK RIVER at Bearmouth - STATION 11.7 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						3%	48	
<i>Optioservus spp.</i>	31	31	31	35	128	2%	32.0	2.0
<i>Zaitzevia sp.</i>	16	30	17	2	65	1%	16.3	11.4
DIPTERA						18%	317	
<i>Thienemannimyia gp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Pentaneura sp.</i>	0	6	0	0	6	0%	1.5	3.0
<i>Pagastia sp</i>	3	0	5	5	13	0%	3.3	2.4
<i>Cardiocladius spp.</i>	0	2	1	0	3	0%	0.8	1.0
<i>Cricotopus spp.</i>	102	12	52	14	180	2%	45.0	42.2
<i>Eukiefferiella spp.</i>	45	10	40	2	97	1%	24.3	21.4
<i>Orthocladius spp.</i>	10	6	1	6	23	0%	5.8	3.7
<i>Parametriocnemus sp.</i>	2	0	70	29	101	1%	25.3	32.6
<i>Tvetenia sp.</i>	77	36	57	56	226	3%	56.5	16.7
<i>Microtendipes sp</i>	52	2	12	37	103	1%	25.8	22.9
<i>Polypedilum spp.</i>	16	11	25	35	87	1%	21.8	10.6
<i>Rheotanytarsus sp.</i>	0	0	1	0	1	0%	0.3	0.5
<i>Micropsectra spp.</i>	18	3	2	0	23	0%	5.8	8.3
<i>Antocha sp.</i>	24	0	1	9	34	0%	8.5	11.1
<i>Hexatoma sp.</i>	1	2	2	1	6	0%	1.5	0.6
<i>Atherix pachypus</i>	20	1	2	6	29	0%	7.3	8.8
<i>Simulium (Psilozoa)</i>	95	69	121	49	334	5%	83.5	31.3
EPHEMEROPTERA						6%	106	
<i>Acentrella insignificans</i>	1	3	1	0	5	0%	1.3	1.3
<i>Baetis tricaudatus</i>	110	34	73	96	313	4%	78.3	33.2
<i>Baetis punctiventris</i>	0	0	2	0	2	0%	0.5	1.0
<i>Attenella margarita</i>	0	1	2	12	15	0%	3.8	5.6
<i>Ephemerella inermis</i>	0	0	1	0	1	0%	0.3	0.5
<i>Drunella grandis</i>	5	0	0	5	10	0%	2.5	2.9
<i>Heptagenia sp.</i>	2	5	5	10	22	0%	5.5	3.3
<i>Nixe sp.</i>	1	0	0	1	2	0%	0.5	0.6
<i>Rhithrogena sp.</i>	5	4	0	0	9	0%	2.3	2.6
<i>Tricorythodes minutus</i>	8	12	12	12	44	1%	11.0	2.0
ODONATA								
<i>Ophiogomphus sp.</i>	1	0	0	0	1	0%	0.3	0.5

B.13 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Bearmouth - STATION 11.7 - 17 AUG 95								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
PLECOPTERA						3%	53	
<i>Claassenia sabulosa</i>	4	5	1	2	12	0%	3.0	1.8
<i>Capnia gp.</i>	0	0	1	0	1	0%	0.3	0.5
<i>Isogenoides sp.</i>	19	53	77	38	187	3%	46.8	24.5
<i>Skwala sp.</i>	3	1	0	1	5	0%	1.3	1.3
<i>Isoperla fulva</i>	0	0	2	1	3	0%	0.8	1.0
<i>Pteronarcella badia</i>	0	0	1	1	2	0%	0.5	0.6
<i>Pteronarcys californica</i>	1	1	0	0	2	0%	0.5	0.6
TRICHOPTERA						71%	1283	
<i>Arctopsyche grandis</i>	11	5	10	6	32	0%	8.0	2.9
<i>Cheumatopsyche spp.</i>	26	21	14	6	67	1%	16.8	8.7
<i>Hydropsyche occidentalis</i>	1339	652	933	1463	4387	61%	1096.8	373.0
<i>Hydropsyche cockerelli</i>	132	98	90	133	453	6%	113.3	22.5
<i>Hydropsyche nr. morosa</i>	32	20	19	15	86	1%	21.5	7.3
<i>Hydroptila spp.</i>	20	36	4	12	72	1%	18.0	13.7
<i>Ochrotrichia sp.</i>	5	0	5	0	10	0%	2.5	2.9
<i>Brachycentrus occidentalis</i>	10	3	4	3	20	0%	5.0	3.4
<i>Glossosoma sp.</i>	1	2	0	0	3	0%	0.8	1.0
ANNELIDA						0%	3	
Tubificidae	0	5	6	0	11	0%	2.8	3.2
ID's by D. McGuire								
TOTAL ORGANISMS	2248	1183	1703	2103	7237		1809	477
TAXA RICHNESS	36	34	38	32	47		35.0	2.6
SHAN. DIVERSITY	2.64	2.80	2.81	2.08	2.64		2.58	0.35
BIOTIC INDEX	5.02	4.92	5.05	4.88	4.97		4.97	0.08
EPT RICHNESS	20	18	20	18	26		19.0	1.2
% R.A. DOMINANT	60%	55%	55%	70%	61%		60%	6.9%
% R.A. FILTERERS	73%	73%	70%	80%	74%		74%	4%
METALS TOLERANCE	5.13	4.82	5.05	4.82	4.97		4.95	0.16
Baetidae/Ephemeroptera	0.84	0.63	0.79	0.71	0.76		0.74	0.09
Hydropsychinae/Trichoptera	0.97	0.95	0.98	0.99	0.97		0.97	0.02
EPT / (EPT + CHIR.)	0.84	0.91	0.83	0.91	0.87		0.87	0.05

B.14 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Bonita - STATION 12 - 16 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						3%	39	
<i>Optioservus</i> spp.	9	66	13	15	103	2%	25.8	26.9
<i>Zaitzevia</i> sp.	5	17	12	20	54	1%	13.5	6.6
DIPTERA						18%	199	
<i>Thienemannimyia</i> gp.	1	20	1	0	22	0%	5.5	9.7
<i>Pentaneura</i> sp.	2	5	0	0	7	0%	1.8	2.4
<i>Pagastia</i> sp	0	11	0	0	11	0%	2.8	5.5
<i>Cardiocladius</i> spp.	1	0	3	0	4	0%	1.0	1.4
<i>Cricotopus</i> spp.	8	44	7	18	77	2%	19.3	17.2
<i>Eukiefferiella</i> spp.	12	13	5	3	33	1%	8.3	5.0
<i>Nanocladius</i> sp.	1	7	1	0	9	0%	2.3	3.2
<i>Orthocladius</i> spp.	1	5	1	1	8	0%	2.0	2.0
<i>Parametriocnemus</i> sp.	8	11	0	0	19	0%	4.8	5.6
<i>Rheocricotopus</i> sp.	0	1	0	0	1	0%	0.3	0.5
<i>Tvetenia</i> sp.	35	69	8	5	117	3%	29.3	29.7
<i>Microtendipes</i> sp	14	40	1	2	57	1%	14.3	18.2
<i>Polypedilum</i> spp.	92	90	9	11	202	4%	50.5	46.8
<i>Rheotanytarsus</i> sp.	0	6	0	1	7	0%	1.8	2.9
<i>Micropsectra</i> spp.	0	5	0	0	5	0%	1.3	2.5
<i>Antocha</i> sp.	14	29	7	3	53	1%	13.3	11.4
<i>Hexatoma</i> sp.	5	5	2	3	15	0%	3.8	1.5
<i>Atherix pachypus</i>	2	13	2	1	18	0%	4.5	5.7
<i>Simulium</i> (Psilozoa)	67	20	15	28	130	3%	32.5	23.6
EPHEMEROPTERA						10%	114	
<i>Acentrella insignificans</i>	0	5	4	2	11	0%	2.8	2.2
<i>Baetis tricaudatus</i>	31	250	12	17	310	7%	77.5	115.3
<i>Baetis punctiventris</i>	2	12	0	1	15	0%	3.8	5.6
<i>Diphetor hageni</i>	0	2	0	0	2	0%	0.5	1.0
<i>Attenella margarita</i>	1	10	2	1	14	0%	3.5	4.4
<i>Ephemerella inermis</i>	1	0	0	0	1	0%	0.3	0.5
<i>Drunella grandis</i>	0	2	0	0	2	0%	0.5	1.0
<i>Heptagenia</i> sp.	0	4	2	0	6	0%	1.5	1.9
<i>Nixe</i> sp.	0	0	1	0	1	0%	0.3	0.5
<i>Rhithrogena</i> sp.	4	0	4	7	15	0%	3.8	2.9
<i>Tricorythodes minutus</i>	13	65	0	0	78	2%	19.5	30.9
PLECOPTERA						3%	29	
<i>Claassenia sabulosa</i>	2	1	1	6	10	0%	2.5	2.4
<i>Isogenoides</i> sp.	24	20	18	32	94	2%	23.5	6.2
<i>Isoperla fulva</i>	2	6	1	3	12	0%	3.0	2.2

B.14 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Bonita - STATION 12 - 16 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
<i>Pteronarcys californica</i>	0	0	0	1	1	0%	0.3	0.5
TRICHOPTERA						66%	745	
<i>Cheumatopsyche</i> spp.	1	49	1	3	54	1%	13.5	23.7
<i>Hydropsyche occidentalis</i>	792	1266	264	179	2501	55%	625.3	506.0
<i>Hydropsyche cockerelli</i>	35	179	32	31	277	6%	69.3	73.2
<i>Hydropsyche</i> nr. <i>morosa</i>	1	10	0	1	12	0%	3.0	4.7
<i>Hydroptila</i> spp.	17	47	6	8	78	2%	19.5	18.9
<i>Ochrotrichia</i> sp.	1	1	0	0	2	0%	0.5	0.6
<i>Brachycentrus occidentalis</i>	10	22	3	14	49	1%	12.3	7.9
<i>Helicopsyche borealis</i>	0	0	0	1	1	0%	0.3	0.5
<i>Glossosoma</i> sp.	1	3	2	1	7	0%	1.8	1.0
ANNELIDA						0%	1	
Tubificidae	1	2	0	0	3	0%	0.8	1.0
MOLLUSCA						0%	0	
<i>Gyraulus</i> sp.	0	0	0	1	1	0%	0.3	0.5
ID's by D. McGuire								
TOTAL ORGANISMS	1216	2433	440	420	4509		1127	946
TAXA RICHNESS	35	40	30	31	47		34.0	4.5
SHAN. DIVERSITY	2.29	2.97	2.63	3.32	2.91		2.80	0.44
BIOTIC INDEX	5.06	4.81	4.78	4.69	4.86		4.83	0.16
EPT RICHNESS	17	19	15	17	24		17.0	1.6
% R.A. DOMINANT	65%	52%	60%	43%	55%		55%	9.8%
% R.A. FILTERERS	75%	64%	72%	61%	67%		68%	6%
METALS TOLERANCE	4.87	4.79	4.81	4.76	4.81		4.81	0.05
Baetidae/Ephemeroptera	0.63	0.77	0.64	0.71	0.74		0.69	0.06
Hydropsychinae/Trichoptera	0.97	0.95	0.96	0.90	0.95		0.95	0.03
EPT / (EPT + CHIR.)	0.84	0.86	0.91	0.88	0.86		0.87	0.03

B.15 MACROINVERTEBRATE DATA								
ROCK CREEK near Clinton - STATION 12.5 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						6%	23	
<i>Optioservus spp.</i>	0	6	3	8	17	1%	4.3	3.5
<i>Zaitzevia sp.</i>	5	46	7	14	72	5%	18.0	19.1
<i>Heterlimnius sp.</i>	0	0	2	0	2	0%	0.5	1.0
<i>Narpus concolor</i>	0	1	0	1	2	0%	0.5	0.6
DIPTERA						45%	167	
<i>Thienemannimyia gp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Pentaneura sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Pagastia sp</i>	2	1	4	32	39	3%	9.8	14.9
<i>Potthastia gaedii gp.</i>	0	0	0	3	3	0%	0.8	1.5
<i>Cardiocladius spp.</i>	0	3	10	7	20	1%	5.0	4.4
<i>Corynoneura sp</i>	1	0	0	0	1	0%	0.3	0.5
<i>Cricotopus spp.</i>	4	0	1	19	24	2%	6.0	8.8
<i>Cricotopus nostococladius</i>	0	0	0	0	0	0%	0.0	0.0
<i>Eukiefferiella spp.</i>	10	4	4	0	18	1%	4.5	4.1
<i>Nanocladius sp.</i>	0	0	1	0	1	0%	0.3	0.5
<i>Orthocladius spp.</i>	4	1	0	7	12	1%	3.0	3.2
<i>Tvetenia sp.</i>	4	4	5	5	18	1%	4.5	0.6
<i>Polypedilum spp.</i>	20	7	4	18	49	3%	12.3	7.9
<i>Rheotanytarsus sp.</i>	0	1	0	4	5	0%	1.3	1.9
<i>Micropsectra spp.</i>	60	132	40	73	305	20%	76.3	39.6
<i>Antocha sp.</i>	3	0	2	23	28	2%	7.0	10.7
<i>Hexatoma sp.</i>	0	6	1	3	10	1%	2.5	2.6
<i>Atherix pachypus</i>	0	0	1	0	1	0%	0.3	0.5
<i>Simulium (Eusimulium)</i>	15	10	94	11	130	9%	32.5	41.1
<i>Chelifera sp.</i>	0	1	0	2	3	0%	0.8	1.0
EPHEMEROPTERA						35%	132	
<i>Acentrella insignificans</i>	16	19	16	39	90	6%	22.5	11.1
<i>Baetis tricaudatus</i>	9	16	39	26	90	6%	22.5	13.0
<i>Dipheter hageni</i>	0	1	1	1	3	0%	0.8	0.5
<i>Attenella margarita</i>	0	3	0	14	17	1%	4.3	6.7
<i>Serratella tibialis</i>	28	59	42	15	144	10%	36.0	18.9
<i>Drunella doddsi</i>	10	5	11	2	28	2%	7.0	4.2
<i>Drunella flavilinea</i>	1	0	0	0	1	0%	0.3	0.5
<i>Drunella grandis</i>	3	1	2	2	8	1%	2.0	0.8
<i>Epeorus albertae</i>	11	16	29	28	84	6%	21.0	8.9
<i>Cinygmula sp.</i>	1	1	0	0	2	0%	0.5	0.6
<i>Nixe sp.</i>	14	12	4	30	60	4%	15.0	10.9
<i>Rhithrogena sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Tricorythodes minutus</i>	1	0	0	0	1	0%	0.3	0.5

B.15 MACROINVERTEBRATE DATA								
ROCK CREEK near Clinton - STATION 12.5 - 17 AUG 95								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
PLECOPTERA						2%	9	
<i>Claassenia sabulosa</i>	0	1	1	1	3	0%	0.8	0.5
<i>Hesperoperla pacifica</i>	7	5	7	2	21	1%	5.3	2.4
<i>Malenka sp.</i>	0	1	1	1	3	0%	0.8	0.5
<i>Cultus sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Skwala sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Pteronarcys californica</i>	0	2	1	0	3	0%	0.8	1.0
Chloroperlinae	1	1	0	1	3	0%	0.8	0.5
TRICHOPTERA						11%	42	
<i>Arctopsyche grandis</i>	20	12	16	9	57	4%	14.3	4.8
<i>Hydropsyche occidentalis</i>	3	6	7	3	19	1%	4.8	2.1
<i>Hydropsyche cockerelli</i>	8	7	7	4	26	2%	6.5	1.7
<i>Neophylax sp.</i>	0	0	0	2	2	0%	0.5	1.0
<i>Lepidostoma sp.</i>	1	0	1	0	2	0%	0.5	0.6
<i>Wormaldia sp.</i>	3	0	2	0	5	0%	1.3	1.5
<i>Brachycentrus occidentalis</i>	8	15	12	14	49	3%	12.3	3.1
<i>Rhyacophila sp.</i>	1	0	0	1	2	0%	0.5	0.6
<i>Helicopsyche borealis</i>	1	1	0	0	2	0%	0.5	0.6
<i>Glossosoma sp.</i>	0	0	1	1	2	0%	0.5	0.6
ANNELIDA						0%	1	
Lumbricidae	0	2	1	1	4	0%	1.0	0.8
Tubificidae	0	0	0	1	1	0%	0.3	0.5
MOLLUSCA						0%	1	
<i>Sphaeriidae</i>	0	1	1	0	2	0%	0.5	0.6
ID's by D. McGuire								
TOTAL ORGANISMS	277	410	381	431	1499		375	68
TAXA RICHNESS	33	36	36	41	57		36.5	3.3
SHAN. DIVERSITY	4.16	3.66	3.90	4.38	4.35		4.03	0.31
BIOTIC INDEX	3.62	3.51	3.62	3.65	3.60		3.60	0.06
EPT RICHNESS	21	20	19	22	30		20.5	1.3
% R.A. DOMINANT	22%	32%	25%	17%	20%		24%	6.4%
% R.A. FILTERERS	21%	12%	36%	10%	19%		20%	12%
METALS TOLERANCE	2.68	2.47	3.40	3.46	3.03		3.00	0.50
Baetidae/Ephemeroptera	0.26	0.27	0.39	0.42	0.35		0.34	0.08
Hydropsychinae/Trichoptera	0.24	0.32	0.30	0.21	0.27		0.27	0.05
EPT / (EPT + CHIR.)	0.58	0.55	0.74	0.54	0.59		0.60	0.10

B.16 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Turah - STATION 10 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						2%	47	
<i>Optioservus spp.</i>	24	28	30	34	116	1%	29.0	4.2
<i>Zaitzevia sp.</i>	18	13	34	7	72	1%	18.0	11.6
DIPTERA						41%	792	
<i>Thienemannimyia gp.</i>	21	15	43	4	83	1%	20.8	16.4
<i>Pentaneura sp.</i>	2	0	5	0	7	0%	1.8	2.4
<i>Pagastia sp</i>	8	4	6	0	18	0%	4.5	3.4
<i>Potthastia gaedii gp.</i>	0	1	10	1	12	0%	3.0	4.7
<i>Cardiocladius spp.</i>	6	2	5	3	16	0%	4.0	1.8
<i>Corynoneura sp</i>	0	0	5	0	5	0%	1.3	2.5
<i>Cricotopus spp.</i>	25	162	919	129	1235	16%	308.8	411.0
<i>Cricotopus nostococladius</i>	0	6	0	0	6	0%	1.5	3.0
<i>Eukiefferiella spp.</i>	37	153	195	60	445	6%	111.3	75.0
<i>Nanocladius sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Orthocladius spp.</i>	0	0	9	6	15	0%	3.8	4.5
<i>Parametriocnemus sp.</i>	2	1	0	0	3	0%	0.8	1.0
<i>Tvetenia sp.</i>	16	2	28	7	53	1%	13.3	11.4
<i>Cryptochironomus sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Microtendipes sp</i>	32	33	27	23	115	1%	28.8	4.6
<i>Phaenopsectra sp</i>	1	0	0	0	1	0%	0.3	0.5
<i>Polypedilum spp.</i>	100	78	54	19	251	3%	62.8	34.7
<i>Rheotanytarsus sp.</i>	16	12	0	3	31	0%	7.8	7.5
<i>Micropsectra spp.</i>	32	34	18	3	87	1%	21.8	14.4
<i>Antocha sp.</i>	14	20	11	11	56	1%	14.0	4.2
<i>Hexatoma sp.</i>	2	5	10	2	19	0%	4.8	3.8
<i>Simulium (Eusimulium)</i>	21	344	221	123	709	9%	177.3	137.9
EPHEMEROPTERA						18%	359	
<i>Acentrella insignificans</i>	16	30	15	13	74	1%	18.5	7.8
<i>Baetis tricaudatus</i>	178	185	161	95	619	8%	154.8	41.1
<i>Baetis punctiventris</i>	1	1	16	8	26	0%	6.5	7.1
<i>Diphetor hageni</i>	7	0	1	5	13	0%	3.3	3.3
<i>Attenella margarita</i>	53	3	35	8	99	1%	24.8	23.5
<i>Serratella tibialis</i>	13	13	7	5	38	0%	9.5	4.1
<i>Ephemerella inermis</i>	0	0	11	2	13	0%	3.3	5.3
<i>Drunella grandis</i>	23	18	13	25	79	1%	19.8	5.4
<i>Epeorus albertae</i>	0	0	1	0	1	0%	0.3	0.5
<i>Heptagenia sp.</i>	1	0	2	0	3	0%	0.8	1.0
<i>Nixe sp.</i>	6	0	1	1	8	0%	2.0	2.7
<i>Rhithrogena sp.</i>	6	0	10	5	21	0%	5.3	4.1
<i>Paraleptophlebia bicornuta</i>	0	0	0	1	1	0%	0.3	0.5

B.16 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Turah - STATION 10 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
<i>Tricorythodes minutus</i>	93	57	237	53	440	6%	110.0	86.6
PLECOPTERA						2%	35	
<i>Claassenia sabulosa</i>	2	3	9	3	17	0%	4.3	3.2
<i>Hesperoperla pacifica</i>	0	3	0	0	3	0%	0.8	1.5
<i>Isogenoides sp.</i>	46	16	24	8	94	1%	23.5	16.4
<i>Skwala sp.</i>	2	0	0	0	2	0%	0.5	1.0
<i>Isoperla fulva</i>	1	4	1	0	6	0%	1.5	1.7
<i>Pteronarcella badia</i>	1	3	1	0	5	0%	1.3	1.3
<i>Pteronarcys californica</i>	2	1	0	1	4	0%	1.0	0.8
Chloroperlinae	4	2	2	1	9	0%	2.3	1.3
TRICHOPTERA						36%	700	
<i>Arctopsyche grandis</i>	17	16	10	17	60	1%	15.0	3.4
<i>Cheumatopsyche spp.</i>	47	60	75	18	200	3%	50.0	24.2
<i>Hydropsyche occidentalis</i>	147	708	262	283	1400	18%	350.0	246.0
<i>Hydropsyche cockerelli</i>	97	115	108	109	429	6%	107.3	7.5
<i>Hydroptila spp.</i>	64	62	58	35	219	3%	54.8	13.4
<i>Ochrotrichia sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Oecetis sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Wormaldia sp.</i>	1	1	0	0	2	0%	0.5	0.6
<i>Psychomyia flavida</i>	1	1	0	0	2	0%	0.5	0.6
<i>Dicosmoecus sp.</i>	2	0	0	0	2	0%	0.5	1.0
<i>Brachycentrus occidentalis</i>	125	133	70	145	473	6%	118.3	33.2
<i>Glossosoma sp.</i>	1	5	2	4	12	0%	3.0	1.8
ANNELIDA						0%	8	
Tubificidae	16	10	0	5	31	0%	7.8	6.8
ID's by D. McGuire								
TOTAL ORGANISMS	1352	2363	2762	1287	7764		1941	736
TAXA RICHNESS	49	42	43	42	59		44.0	3.4
SHAN. DIVERSITY	4.47	3.68	3.69	3.94	4.10		3.95	0.37
BIOTIC INDEX	4.37	4.94	5.51	4.67	5.00		4.87	0.48
EPT RICHNESS	28	23	25	25	34		25.3	2.1
% R.A. DOMINANT	13%	30%	33%	22%	18%		25%	9.0%
% R.A. FILTERERS	35%	59%	27%	54%	43%		44%	15%
METALS TOLERANCE	4.13	5.12	6.49	5.01	5.42		5.19	0.97
Baetidae/Ephemeroptera	0.51	0.70	0.38	0.55	0.51		0.53	0.13
Hydropsychinae/Trichoptera	0.58	0.80	0.76	0.67	0.72		0.70	0.10
EPT / (EPT + CHIR.)	0.76	0.74	0.46	0.77	0.65		0.68	0.15

B.17 MACROINVERTEBRATE DATA								
BLACKFOOT RIVER at USGS - STATION 14 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						7%	39	
<i>Optioservus spp.</i>	32	19	31	22	104	5%	26.0	6.5
<i>Zaitzevia sp.</i>	4	6	16	21	47	2%	11.8	8.1
<i>Cleptelmis ornata</i>	0	2	0	1	3	0%	0.8	1.0
DIPTERA						48%	258	
<i>Thienemannimyia gp.</i>	1	4	1	0	6	0%	1.5	1.7
<i>Pagastia sp</i>	1	0	0	1	2	0%	0.5	0.6
<i>Cardiocladius spp.</i>	1	1	0	1	3	0%	0.8	0.5
<i>Corynoneura sp</i>	2	0	0	0	2	0%	0.5	1.0
<i>Cricotopus spp.</i>	1	20	0	2	23	1%	5.8	9.5
<i>Cricotopus nostococladius</i>	0	0	0	1	1	0%	0.3	0.5
<i>Eukiefferiella spp.</i>	1	4	0	2	7	0%	1.8	1.7
<i>Orthocladius spp.</i>	2	1	1	2	6	0%	1.5	0.6
<i>Parametrioctenus sp.</i>	2	0	0	0	2	0%	0.5	1.0
<i>Tvetenia sp.</i>	1	0	4	0	5	0%	1.3	1.9
<i>Microtendipes sp</i>	2	0	0	1	3	0%	0.8	1.0
<i>Polypedilum spp.</i>	9	15	5	5	34	2%	8.5	4.7
<i>Rheotanytarsus sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Micropsectra spp.</i>	130	564	118	90	902	42%	225.5	226.3
<i>Antocha sp.</i>	1	1	0	3	5	0%	1.3	1.3
<i>Limonia sp. ?</i>	0	0	1	0	1	0%	0.3	0.5
<i>Hexatoma sp.</i>	6	3	6	5	20	1%	5.0	1.4
<i>Ceratopogoninae</i>	0	1	3	0	4	0%	1.0	1.4
<i>Simulium (Eusimulium)</i>	3	1	1	0	5	0%	1.3	1.3
EPHEMEROPTERA						12%	66	
<i>Acentrella insignificans</i>	20	13	3	3	39	2%	9.8	8.3
<i>Baetis tricaudatus</i>	15	17	15	3	50	2%	12.5	6.4
<i>Dipheter hageni</i>	6	2	0	1	9	0%	2.3	2.6
<i>Attenella margarita</i>	4	2	0	1	7	0%	1.8	1.7
<i>Serratella tibialis</i>	11	37	24	5	77	4%	19.3	14.2
<i>Drunella doddsi</i>	1	5	11	4	21	1%	5.3	4.2
<i>Drunella grandis</i>	1	1	8	7	17	1%	4.3	3.8
<i>Epeorus albertae</i>	1	1	4	0	6	0%	1.5	1.7
<i>Rhithrogena sp.</i>	12	6	8	2	28	1%	7.0	4.2
<i>Paraleptophlebia bicornuta</i>	1	0	0	0	1	0%	0.3	0.5
<i>Paraleptophlebia sp.</i>	2	0	0	0	2	0%	0.5	1.0
<i>Tricorythodes minutus</i>	2	3	2	1	8	0%	2.0	0.8

B.17 MACROINVERTEBRATE DATA								
BLACKFOOT RIVER at USGS - STATION 14 - 17 AUG 95								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
LEPIDOPTERA								
<i>Petrophila sp.</i>	0	0	1	0	1	0%	0.3	0.5
PLECOPTERA						3%	18	
<i>Claassenia sabulosa</i>	4	9	3	3	19	1%	4.8	2.9
<i>Hesperoperla pacifica</i>	0	0	2	0	2	0%	0.5	1.0
<i>Calineuria californica</i>	4	5	3	1	13	1%	3.3	1.7
<i>Cultus sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Skwala sp.</i>	3	0	0	0	3	0%	0.8	1.5
<i>Pteronarcys californica</i>	1	2	19	1	23	1%	5.8	8.8
Chloroperlinae	4	3	1	4	12	1%	3.0	1.4
TRICHOPTERA						27%	145	
<i>Arctopsyche grandis</i>	7	3	23	3	36	2%	9.0	9.5
<i>Cheumatopsyche spp.</i>	13	7	12	8	40	2%	10.0	2.9
<i>Hydropsyche occidentalis</i>	16	24	64	19	123	6%	30.8	22.4
<i>Hydropsyche cockerelli</i>	17	31	114	47	209	10%	52.3	43.0
<i>Dicosmoecus sp.</i>	9	1	0	0	10	0%	2.5	4.4
<i>Wormaldia sp.</i>	2	6	2	0	10	0%	2.5	2.5
<i>Psychomyia flavida</i>	0	0	0	3	3	0%	0.8	1.5
<i>Brachycentrus occidentalis</i>	9	19	27	23	78	4%	19.5	7.7
<i>Rhyacophila angelita gp.</i>	4	9	9	13	35	2%	8.8	3.7
<i>Rhyacophila coloradensis gp.</i>	0	1	0	1	2	0%	0.5	0.6
<i>Helicopsyche borealis</i>	0	1	0	0	1	0%	0.3	0.5
<i>Glossosoma sp.</i>	9	4	9	9	31	1%	7.8	2.5
ANNELIDA						0%	2	
Lumbricidae	1	2	0	2	5	0%	1.3	1.0
Lumbriculidae	1	1	1	0	3	0%	0.8	0.5
MOLLUSCA						1%	6	
<i>Physella sp.</i>	15	1	0	0	16	1%	4.0	7.3
<i>Stagnicola sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Sphaeriidae</i>	4	0	2	0	6	0%	1.5	1.9
OTHER								
Turbellaria	0	0	1	5	6	0%	1.5	2.4
ID's by D. McGuire								

B.17 M A C R O I N V E R T E B R A T E D A T A								
BLACKFOOT RIVER at USGS - STATION 14 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TOTAL ORGANISMS	401	858	555	326	2140		535	235
TAXA RICHNESS	50	42	36	38	60		41.5	6.2
SHAN. DIVERSITY	4.20	2.48	3.84	3.93	3.68		3.61	0.77
BIOTIC INDEX	3.89	3.88	3.57	3.59	3.76		3.74	0.18
EPT RICHNESS	27	25	21	22	31		23.8	2.8
% R.A. DOMINANT	32%	66%	21%	28%	42%		37%	20%
% R.A. FILTERERS	17%	11%	44%	31%	23%		26%	15%
METALS TOLERANCE	2.71	1.98	2.92	2.91	2.50		2.63	0.44
Baetidae/Ephemeroptera	0.54	0.37	0.24	0.26	0.37		0.35	0.14
Hydropsychinae/Trichoptera	0.64	0.59	0.73	0.59	0.66		0.64	0.07
EPT / (EPT + CHIR.)	0.54	0.26	0.74	0.61	0.48		0.54	0.20

B.18 MACROINVERTEBRATE DATA								
CLARK FORK RIVER above Missoula - STATION 15.5 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						5%	100	
<i>Optioservus spp.</i>	104	60	89	25	278	3%	69.5	34.8
<i>Zaitzevia sp.</i>	35	28	18	6	87	1%	21.8	12.6
<i>Cleptelmis ornata</i>	0	20	7	3	30	0%	7.5	8.8
<i>Ordobrevia sp.</i>	0	1	0	2	3	0%	0.8	1.0
DIPTERA						13%	268	
<i>Thienemannimyia gp.</i>	3	0	8	4	15	0%	3.8	3.3
<i>Pentaneura sp.</i>	5	0	1	0	6	0%	1.5	2.4
<i>Pagastia sp</i>	35	10	81	13	139	2%	34.8	32.8
<i>Potthastia gaedii gp.</i>	0	0	0	6	6	0%	1.5	3.0
<i>Cricotopus spp.</i>	19	7	12	20	58	1%	14.5	6.1
<i>Cricotopus nostococladius</i>	28	12	11	9	60	1%	15.0	8.8
<i>Eukiefferiella spp.</i>	57	26	11	8	102	1%	25.5	22.4
<i>Nanocladius sp.</i>	1	5	0	0	6	0%	1.5	2.4
<i>Orthocladius spp.</i>	27	122	30	11	190	2%	47.5	50.4
<i>Parametriocnemus sp.</i>	5	0	0	5	10	0%	2.5	2.9
<i>Tvetenia sp.</i>	3	21	20	23	67	1%	16.8	9.3
<i>Microtendipes sp</i>	5	0	7	2	14	0%	3.5	3.1
<i>Polypedilum spp.</i>	18	41	33	29	121	1%	30.3	9.6
<i>Rheotanytarsus sp.</i>	2	1	4	7	14	0%	3.5	2.6
<i>Micropsectra spp.</i>	47	19	39	41	146	2%	36.5	12.2
<i>Antocha sp.</i>	43	3	6	44	96	1%	24.0	22.6
<i>Simulium (Eusimulium)</i>	6	17	0	0	23	0%	5.8	8.0
EPHEMEROPTERA						12%	257	
<i>Acentrella insignificans</i>	1	11	5	17	34	0%	8.5	7.0
<i>Baetis tricaudatus</i>	99	134	65	63	361	4%	90.3	33.5
<i>Dipheter hageni</i>	1	1	3	12	17	0%	4.3	5.3
<i>Attenella margarita</i>	20	5	24	13	62	1%	15.5	8.3
<i>Serratella tibialis</i>	52	75	76	65	268	3%	67.0	11.2
<i>Drunella doddsi</i>	0	0	0	1	1	0%	0.3	0.5
<i>Drunella grandis</i>	57	31	44	46	178	2%	44.5	10.7
<i>Timpango hecuba</i>	0	0	0	1	1	0%	0.3	0.5
<i>Epeorus albertae</i>	1	1	0	3	5	0%	1.3	1.3
<i>Heptagenia sp.</i>	0	0	4	3	7	0%	1.8	2.1
<i>Nixe sp.</i>	8	5	2	5	20	0%	5.0	2.4
<i>Rhithrogena sp.</i>	6	14	1	2	23	0%	5.8	5.9
<i>Paraleptophlebia bicornuta</i>	0	0	1	2	3	0%	0.8	1.0
<i>Paraleptophlebia sp.</i>	0	0	1	2	3	0%	0.8	1.0
<i>Tricorythodes minutus</i>	5	0	29	12	46	1%	11.5	12.7

B.18 MACROINVERTEBRATE DATA								
CLARK FORK RIVER above Missoula - STATION 15.5 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
HEMIPTERA								
<i>Saldula sp.</i>	2	0	0	0	2	0%	0.5	1.0
PLECOPTERA						3%	58	
<i>Claassenia sabulosa</i>	1	3	0	2	6	0%	1.5	1.3
<i>Hesperoperla pacifica</i>	4	7	13	11	35	0%	8.8	4.0
<i>Calineuria californica</i>	0	2	0	1	3	0%	0.8	1.0
<i>Amphinemura sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Isogenoides sp.</i>	7	0	12	23	42	1%	10.5	9.7
<i>Skwala sp.</i>	2	1	0	1	4	0%	1.0	0.8
<i>Pteronarcella badia</i>	6	7	18	2	33	0%	8.3	6.8
<i>Pteronarcys californica</i>	22	30	29	23	104	1%	26.0	4.1
Chloroperlinae	1	0	0	2	3	0%	0.8	1.0
TRICHOPTERA						67%	1398	
<i>Arctopsyche grandis</i>	15	24	25	11	75	1%	18.8	6.8
<i>Cheumatopsyche spp.</i>	235	202	215	187	839	10%	209.8	20.4
<i>Hydropsyche occidentalis</i>	541	1001	452	298	2292	27%	573.0	302.5
<i>Hydropsyche cockerelli</i>	497	483	661	521	2162	26%	540.5	81.9
<i>Hydroptila spp.</i>	8	1	13	1	23	0%	5.8	5.9
<i>Ochrotrichia sp.</i>	6	0	0	0	6	0%	1.5	3.0
<i>Oecetis sp.</i>	1	0	1	0	2	0%	0.5	0.6
<i>Wormaldia sp.</i>	0	0	2	2	4	0%	1.0	1.2
<i>Psychomyia flavida</i>	3	0	1	1	5	0%	1.3	1.3
<i>Brachycentrus occidentalis</i>	52	16	83	27	178	2%	44.5	29.8
<i>Micrasema sp.</i>	0	1	0	1	2	0%	0.5	0.6
<i>Rhyacophila sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Glossosoma sp.</i>	0	0	0	1	1	0%	0.3	0.5
ANNELIDA						0%	7	
Lumbricidae	4	0	3	6	13	0%	3.3	2.5
Lumbriculidae	2	3	2	5	12	0%	3.0	1.4
Naididae	0	0	1	0	1	0%	0.3	0.5
MOLLUSCA						0%	0	
<i>Ferrissia sp.</i>	0	0	0	1	1	0%	0.3	0.5
Sphaeriidae	0	0	1	0	1	0%	0.3	0.5
OTHER								
Turbellaria	0	6	0	1	7	0%	1.8	2.9
ID's by D. McGuire								

B.18 M A C R O I N V E R T E B R A T E D A T A								
CLARK FORK RIVER above Missoula - STATION 15.5 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TOTAL ORGANISMS	2103	2457	2164	1634	8358		2090	341
TAXA RICHNESS	48	40	45	56	65		47.3	6.7
SHAN. DIVERSITY	3.64	3.12	3.59	3.70	3.61		3.51	0.27
BIOTIC INDEX	4.35	4.53	4.09	4.13	4.29		4.28	0.20
EPT RICHNESS	27	22	25	34	37		27.0	5.1
% R.A. DOMINANT	26%	41%	31%	32%	27%		32%	6.3%
% R.A. FILTERERS	64%	71%	67%	64%	67%		67%	3%
METALS TOLERANCE	4.44	4.46	4.28	4.06	4.33		4.31	0.19
Baetidae/Ephemeroptera	0.40	0.53	0.29	0.37	0.40		0.40	0.10
Hydropsychinae/Trichoptera	0.94	0.98	0.91	0.96	0.95		0.95	0.03
EPT / (EPT + CHIR.)	0.87	0.89	0.87	0.88	0.88		0.88	0.01

B.19 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Shuffield's - STATION 18 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						0%	9	
<i>Optioservus spp.</i>	10	2	12	5	29	0%	7.3	4.6
<i>Zaitzevia sp.</i>	1	1	4	0	6	0%	1.5	1.7
DIPTERA						37%	740	
<i>Thienemannimyia gp.</i>	0	4	11	2	17	0%	4.3	4.8
<i>Pagastia sp</i>	5	10	0	5	20	0%	5.0	4.1
<i>Potthastia gaedii gp.</i>	6	16	0	6	28	0%	7.0	6.6
<i>Brillia sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Cardiocladius spp.</i>	28	3	33	28	92	1%	23.0	13.5
<i>Corynoneura sp</i>	1	0	0	1	2	0%	0.5	0.6
<i>Cricotopus spp.</i>	298	278	355	306	1237	16%	309.3	32.7
<i>Eukiefferiella spp.</i>	77	14	136	34	261	3%	65.3	54.0
<i>Nanocladius sp.</i>	5	7	0	5	17	0%	4.3	3.0
<i>Orthocladius spp.</i>	20	18	18	23	79	1%	19.8	2.4
<i>Synorthocladius sp.</i>	0	5	0	0	5	0%	1.3	2.5
<i>Tvetenia sp.</i>	15	3	37	13	68	1%	17.0	14.3
<i>Microtendipes sp</i>	6	1	0	0	7	0%	1.8	2.9
<i>Phaenopsectra sp</i>	1	0	0	0	1	0%	0.3	0.5
<i>Polypedilum spp.</i>	91	235	182	132	640	8%	160.0	62.3
<i>Xenochironomus sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Rheotanytarsus sp.</i>	17	68	10	28	123	2%	30.8	25.9
<i>Micropsectra spp.</i>	73	51	53	63	240	3%	60.0	10.1
<i>Antocha sp.</i>	1	4	0	5	10	0%	2.5	2.4
<i>Ceratopogoninae</i>	0	0	1	0	1	0%	0.3	0.5
<i>Atherix pachypus</i>	1	0	0	0	1	0%	0.3	0.5
<i>Simulium spp.</i>	34	1	58	16	109	1%	27.3	24.5
Empididae	0	0	0	1	1	0%	0.3	0.5
EPHEMEROPTERA						21%	422	
<i>Acentrella insignificans</i>	76	126	22	103	327	4%	81.8	44.8
<i>Baetis tricaudatus</i>	250	84	444	170	948	12%	237.0	153.7
<i>Dipheter hageni</i>	10	16	0	12	38	0%	9.5	6.8
<i>Attenella margarita</i>	12	8	5	10	35	0%	8.8	3.0
<i>Serratella tibialis</i>	4	0	2	4	10	0%	2.5	1.9
<i>Drunella grandis</i>	5	0	1	0	6	0%	1.5	2.4
<i>Epeorus albertae</i>	3	0	0	3	6	0%	1.5	1.7
<i>Nixe sp.</i>	3	7	0	1	11	0%	2.8	3.1
<i>Rhithrogena sp.</i>	9	6	7	6	28	0%	7.0	1.4
<i>Paraleptophlebia bicornuta</i>	1	1	0	0	2	0%	0.5	0.6
<i>Tricorythodes minutus</i>	72	46	89	69	276	3%	69.0	17.7

B.19 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Shuffield's - STATION 18 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
LEPIDOPTERA								
<i>Petrophila sp.</i>	1	1	5	10	17	0%	4.3	4.3
PLECOPTERA								
						1%	26	
<i>Claassenia sabulosa</i>	3	3	8	7	21	0%	5.3	2.6
<i>Hesperoperla pacifica</i>	2	0	2	0	4	0%	1.0	1.2
<i>Calineuria californica</i>	0	3	0	1	4	0%	1.0	1.4
<i>Amphinemura sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Zapada cinctipes</i>	1	0	0	0	1	0%	0.3	0.5
<i>Isogenoides sp.</i>	20	7	24	13	64	1%	16.0	7.5
<i>Skwala sp.</i>	1	3	1	2	7	0%	1.8	1.0
<i>Pteronarcella badia</i>	1	0	0	0	1	0%	0.3	0.5
<i>Pteronarcys californica</i>	1	0	0	0	1	0%	0.3	0.5
TRICHOPTERA								
						39%	784	
<i>Arctopsyche grandis</i>	23	28	44	15	110	1%	27.5	12.2
<i>Cheumatopsyche spp.</i>	182	30	289	170	671	8%	167.8	106.3
<i>Hydropsyche occidentalis</i>	220	60	1065	428	1773	22%	443.3	441.0
<i>Hydropsyche cockerelli</i>	64	28	178	29	299	4%	74.8	70.8
<i>Hydroptila spp.</i>	53	12	23	87	175	2%	43.8	33.6
<i>Ochrotrichia sp.</i>	1	0	5	0	6	0%	1.5	2.4
<i>Oecetis sp.</i>	0	0	1	0	1	0%	0.3	0.5
<i>Wormaldia sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Psychomyia flavida</i>	0	0	0	24	24	0%	6.0	12.0
<i>Brachycentrus occidentalis</i>	14	11	13	5	43	1%	10.8	4.0
<i>Rhyacophila sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Glossosoma sp.</i>	9	15	5	3	32	0%	8.0	5.3
ANNELIDA								
						0%	4	
Lumbricidae	0	4	2	4	10	0%	2.5	1.9
Naididae	0	0	0	5	5	0%	1.3	2.5
MOLLUSCA								
						0%	0	
<i>Sphaeriidae</i>	1	0	0	0	1	0%	0.3	0.5
OTHER								
Turbellaria	6	6	0	0	12	0%	3.0	3.5
ID's by D. McGuire								

B.19 M A C R O I N V E R T E B R A T E D A T A								
CLARK FORK RIVER at Shuffield's - STATION 18 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TOTAL ORGANISMS	1739	1229	3145	1855	7968		1992	815
TAXA RICHNESS	49	43	35	42	62		42.3	5.7
SHAN. DIVERSITY	4.04	3.87	3.31	3.83	3.87		3.76	0.31
BIOTIC INDEX	5.08	5.15	5.09	5.14	5.11		5.12	0.04
EPT RICHNESS	27	20	20	22	32		22.3	3.3
% R.A. DOMINANT	17%	23%	34%	23%	22%		24%	7.0%
% R.A. FILTERERS	32%	18%	53%	37%	39%		35%	14%
METALS TOLERANCE	5.47	5.12	5.41	5.32	5.36		5.33	0.15
Baetidae/Ephemeroptera	0.76	0.77	0.82	0.75	0.78		0.77	0.03
Hydropsychinae/Trichoptera	0.82	0.64	0.94	0.82	0.87		0.81	0.13
EPT / (EPT + CHIR.)	0.62	0.41	0.73	0.64	0.63		0.60	0.14

B.20 MACROINVERTEBRATE DATA								
BITTERROOT RIVER near mouth - STATION 19 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
HEMIPTERA								
<i>Sigara sp.</i>	1	0	1	0	2	0%	0.5	0.6
LEPIDOPTERA								
<i>Petrophila sp.</i>	0	7	0	8	15	0%	3.8	4.3
PLECOPTERA						3%	27	
<i>Claassenia sabulosa</i>	0	2	1	0	3	0%	0.8	1.0
<i>Isogenoides sp.</i>	11	4	11	4	30	1%	7.5	4.0
<i>Skwala sp.</i>	6	7	5	3	21	1%	5.3	1.7
<i>Pteronarcella badia</i>	5	1	42	3	51	1%	12.8	19.6
<i>Pteronarcys californica</i>	1	0	0	0	1	0%	0.3	0.5
TRICHOPTERA						58%	545	
<i>Arctopsyche grandis</i>	1	2	5	2	10	0%	2.5	1.7
<i>Cheumatopsyche spp.</i>	120	97	660	86	963	26%	240.8	279.9
<i>Hydropsyche occidentalis</i>	73	37	451	85	646	17%	161.5	194.1
<i>Hydropsyche cockerelli</i>	18	17	22	6	63	2%	15.8	6.8
<i>Hydropsyche slossonae</i>	1	0	0	0	1	0%	0.3	0.5
<i>Dicosmoecus sp.</i>	2	2	1	0	5	0%	1.3	1.0
<i>Limnophilus sp.</i>	1	0	1	1	3	0%	0.8	0.5
<i>Ceraclea sp.</i>	2	2	0	1	5	0%	1.3	1.0
<i>Oecetis sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Psychomyia flavida</i>	0	1	0	0	1	0%	0.3	0.5
<i>Brachycentrus occidentalis</i>	2	18	13	11	44	1%	11.0	6.7
<i>Glossosoma sp.</i>	100	117	136	84	437	12%	109.3	22.4
ANNELIDA						1%	12	
Lumbricidae	4	4	10	18	36	1%	9.0	6.6
Naididae	0	2	0	8	10	0%	2.5	3.8
Tubificidae	0	0	2	0	2	0%	0.5	1.0
CRUSTACEA								
<i>Pacifasticus sp.</i>	0	0	0	1	1	0%	0.3	0.5
MOLLUSCA						0%	0	
<i>Physella sp.</i>	1	0	0	0	1	0%	0.3	0.5
OTHER								
Nematomorpha	0	0	1	0	1	0%	0.3	0.5
ID's by D. McGuire								

B.20 M A C R O I N V E R T E B R A T E D A T A								
BITTERROOT RIVER near mouth - STATION 19 - 17 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TOTAL ORGANISMS	622	633	1713	785	3753		938	522
TAXA RICHNESS	44	40	40	40	60		41.0	2.0
SHAN. DIVERSITY	4.06	4.09	2.97	4.27	3.86		3.85	0.59
BIOTIC INDEX	3.76	3.55	4.42	4.31	4.14		4.01	0.42
EPT RICHNESS	25	21	22	19	30		21.8	2.5
% R.A. DOMINANT	19%	18%	39%	11%	26%		22%	12%
% R.A. FILTERERS	40%	33%	73%	33%	52%		45%	19%
METALS TOLERANCE	3.74	3.61	4.28	4.12	4.04		3.94	0.32
Baetidae/Ephemeroptera	0.07	0.03	0.17	0.05	0.07		0.08	0.06
Hydropsychinae/Trichoptera	0.67	0.52	0.88	0.64	0.77		0.68	0.15
EPT / (EPT + CHIR.)	0.82	0.81	0.91	0.69	0.83		0.81	0.09

B.21 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Harper Bridge - STATION 20 - 18 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						1%	30	
<i>Optioservus spp.</i>	30	15	5	40	90	1%	22.5	15.5
<i>Zaitzevia sp.</i>	6	11	3	8	28	0%	7.0	3.4
DIPTERA						22%	540	
<i>Thienemannimyia gp.</i>	13	0	20	5	38	0%	9.5	8.8
<i>Pentaneura sp.</i>	0	1	3	0	4	0%	1.0	1.4
<i>Pagastia sp</i>	6	0	5	0	11	0%	2.8	3.2
<i>Potthastia gaedii gp.</i>	14	12	43	16	85	1%	21.3	14.6
<i>Cardiocladius spp.</i>	3	10	3	0	16	0%	4.0	4.2
<i>Cricotopus spp.</i>	228	96	151	209	684	7%	171.0	59.8
<i>Eukiefferiella spp.</i>	31	10	2	23	66	1%	16.5	13.0
<i>Orthocladius spp.</i>	12	21	3	19	55	1%	13.8	8.1
<i>Parametriocnemus sp.</i>	2	0	0	0	2	0%	0.5	1.0
<i>Synorthocladius sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Tvetenia sp.</i>	44	62	15	12	133	1%	33.3	24.0
<i>Microtendipes sp</i>	1	11	23	0	35	0%	8.8	10.7
<i>Phaenopsectra sp</i>	0	0	1	0	1	0%	0.3	0.5
<i>Polypedilum spp.</i>	77	52	131	27	287	3%	71.8	44.5
<i>Cladotanytarsus sp.</i>	1	8	1	6	16	0%	4.0	3.6
<i>Rheotanytarsus sp.</i>	85	154	147	133	519	5%	129.8	31.1
<i>Micropsectra spp.</i>	3	7	2	32	44	0%	11.0	14.2
<i>Antocha sp.</i>	8	5	5	4	22	0%	5.5	1.7
<i>Atherix pachypus</i>	47	17	13	8	85	1%	21.3	17.6
<i>Simulium (Psilozoa)</i>	17	6	3	11	37	0%	9.3	6.1
<i>Clinocera sp.</i>	0	10	3	3	16	0%	4.0	4.2
<i>Protanyderus sp.</i>	0	1	0	1	2	0%	0.5	0.6
EPHEMEROPTERA						12%	301	
<i>Baetis tricaudatus</i>	139	151	37	107	434	4%	108.5	51.2
<i>Dipheter hageni</i>	10	5	9	0	24	0%	6.0	4.5
<i>Attenella margarita</i>	37	13	100	46	196	2%	49.0	36.7
<i>Serratella tibialis</i>	2	0	1	3	6	0%	1.5	1.3
<i>Ephemerella inermis</i>	1	0	6	0	7	0%	1.8	2.9
<i>Drunella grandis</i>	5	16	0	0	21	0%	5.3	7.5
<i>Nixe sp.</i>	3	2	25	1	31	0%	7.8	11.5
<i>Rhithrogena sp.</i>	23	20	9	6	58	1%	14.5	8.3
<i>Paraleptophlebia bicornuta</i>	0	0	7	0	7	0%	1.8	3.5
<i>Tricorythodes minutus</i>	58	49	248	63	418	4%	104.5	95.8
LEPIDOPTERA								
<i>Petrophila sp.</i>	10	0	14	0	24	0%	6.0	7.1

B.21 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Harper Bridge - STATION 20 - 18 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
ODONATA								
<i>Ophiogomphus sp.</i>	0	0	0	1	1	0%	0.3	0.5
PLECOPTERA						1%	19	
<i>Claassenia sabulosa</i>	0	1	0	4	5	0%	1.3	1.9
<i>Hesperoperla pacifica</i>	1	1	0	1	3	0%	0.8	0.5
<i>Isogenoides sp.</i>	16	4	18	19	57	1%	14.3	6.9
<i>Skwala sp.</i>	0	1	1	3	5	0%	1.3	1.3
<i>Isoperla fulva</i>	0	1	0	0	1	0%	0.3	0.5
<i>Pteronarcella badia</i>	0	0	0	1	1	0%	0.3	0.5
<i>Pteronarcys californica</i>	0	2	0	0	2	0%	0.5	1.0
TRICHOPTERA						63%	1531	
<i>Arctopsyche grandis</i>	6	14	1	7	28	0%	7.0	5.4
<i>Cheumatopsyche spp.</i>	124	392	47	312	875	9%	218.8	160.4
<i>Hydropsyche occidentalis</i>	1489	1589	523	1109	4710	48%	1177.5	482.8
<i>Hydropsyche cockerelli</i>	29	12	22	12	75	1%	18.8	8.3
<i>Hydroptila spp.</i>	65	40	46	31	182	2%	45.5	14.4
<i>Ceraclea sp.</i>	1	0	1	7	9	0%	2.3	3.2
<i>Psychomyia flavida</i>	6	0	2	0	8	0%	2.0	2.8
<i>Brachycentrus occidentalis</i>	20	21	9	5	55	1%	13.8	8.0
<i>Glossosoma sp.</i>	21	68	39	55	183	2%	45.8	20.3
ANNELIDA						0%	10	
Lumbricidae	4	12	11	11	38	0%	9.5	3.7
Naididae	0	0	3	0	3	0%	0.8	1.5
ID's by D. McGuire								
TOTAL ORGANISMS	2699	2923	1761	2361	9744		2436	506
TAXA RICHNESS	42	40	44	38	54		41.0	2.6
SHAN. DIVERSITY	2.88	2.74	3.71	3.01	3.17		3.09	0.43
BIOTIC INDEX	4.97	4.85	4.77	4.96	4.90		4.89	0.09
EPT RICHNESS	20	20	20	19	26		19.8	0.5
% R.A. DOMINANT	55%	54%	30%	47%	48%		47%	12%
% R.A. FILTERERS	66%	75%	43%	67%	65%		63%	14%
METALS TOLERANCE	5.05	4.69	4.35	4.90	4.78		4.75	0.30
Baetidae/Ephemeroptera	0.54	0.61	0.10	0.47	0.38		0.43	0.22
Hydropsychinae/Trichoptera	0.93	0.93	0.86	0.93	0.92		0.91	0.04
EPT / (EPT + CHIR.)	0.80	0.84	0.68	0.79	0.79		0.78	0.07

B.22 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Huson - STATION 22 - 18 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						1%	14	
<i>Optioservus spp.</i>	4	3	21	13	41	1%	10.3	8.5
<i>Zaitzevia sp.</i>	4	5	0	4	13	0%	3.3	2.2
DIPTERA						67%	806	
<i>Thienemannimyia gp.</i>	2	0	0	2	4	0%	1.0	1.2
<i>Potthastia gaedii gp.</i>	0	0	0	2	2	0%	0.5	1.0
<i>Cardiocladius spp.</i>	0	12	1	12	25	1%	6.3	6.7
<i>Cricotopus spp.</i>	41	34	71	56	202	4%	50.5	16.5
<i>Eukiefferiella spp.</i>	1	6	1	3	11	0%	2.8	2.4
<i>Orthocladius spp.</i>	12	25	28	24	89	2%	22.3	7.0
<i>Synorthocladius sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Tvetenia sp.</i>	2	0	3	14	19	0%	4.8	6.3
<i>Microtendipes sp</i>	1	1	6	1	9	0%	2.3	2.5
<i>Polypedilum spp.</i>	16	23	24	33	96	2%	24.0	7.0
<i>Rheotanytarsus sp.</i>	20	64	37	83	204	4%	51.0	28.0
<i>Micropsectra spp.</i>	9	1	27	3	40	1%	10.0	11.8
<i>Antocha sp.</i>	3	0	1	0	4	0%	1.0	1.4
<i>Hexatoma sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Atherix pachypus</i>	0	1	0	2	3	0%	0.8	1.0
<i>Simulium (Eusimulium)</i>	261	1060	293	900	2514	52%	628.5	411.3
<i>Ceratopogoninae</i>	0	0	0	1	1	0%	0.3	0.5
EPHEMEROPTERA						9%	109	
<i>Acentrella insignificans</i>	0	0	1	0	1	0%	0.3	0.5
<i>Baetis tricaudatus</i>	24	70	42	57	193	4%	48.3	19.8
<i>Dipheter hageni</i>	2	0	9	6	17	0%	4.3	4.0
<i>Attenella margarita</i>	8	11	33	7	59	1%	14.8	12.3
<i>Serratella tibialis</i>	0	1	0	3	4	0%	1.0	1.4
<i>Ephemerella inermis</i>	0	0	0	1	1	0%	0.3	0.5
<i>Heptagenia sp.</i>	1	5	1	1	8	0%	2.0	2.0
<i>Nixe sp.</i>	2	0	0	4	6	0%	1.5	1.9
<i>Rhithrogena sp.</i>	28	23	28	48	127	3%	31.8	11.1
<i>Paraleptophlebia bicornuta</i>	0	0	1	0	1	0%	0.3	0.5
<i>Paraleptophlebia sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Tricorythodes minutus</i>	8	3	2	5	18	0%	4.5	2.6
HEMIPTERA								
<i>Sigara sp.</i>	1	1	6	1	9	0%	2.3	2.5

B.22 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Huson - STATION 22 - 18 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
PLECOPTERA						2%	28	
<i>Claassenia sabulosa</i>	4	3	3	3	13	0%	3.3	0.5
<i>Isogenoides sp.</i>	20	20	24	33	97	2%	24.3	6.1
<i>Isoperla fulva</i>	0	0	0	1	1	0%	0.3	0.5
<i>Pteronarcys californica</i>	0	1	0	0	1	0%	0.3	0.5
TRICHOPTERA						20%	245	
<i>Arctopsyche grandis</i>	0	2	0	1	3	0%	0.8	1.0
<i>Cheumatopsyche spp.</i>	36	65	33	40	174	4%	43.5	14.6
<i>Hydropsyche occidentalis</i>	83	231	84	253	651	14%	162.8	92.0
<i>Hydropsyche cockerelli</i>	2	13	0	11	26	1%	6.5	6.5
<i>Brachycentrus occidentalis</i>	0	3	1	0	4	0%	1.0	1.4
<i>Glossosoma sp.</i>	37	14	11	59	121	3%	30.3	22.4
ANNELIDA						0%	1	
Lumbricidae	1	1	0	0	2	0%	0.5	0.6
MOLLUSCA						0%	1	
<i>Physella sp.</i>	0	0	2	0	2	0%	0.5	1.0
ID's by D. McGuire								
TOTAL ORGANISMS	633	1702	794	1690	4819		1205	571
TAXA RICHNESS	28	29	28	37	44		30.5	4.4
SHAN. DIVERSITY	3.20	2.22	3.40	2.69	2.80		2.88	0.53
BIOTIC INDEX	4.51	4.90	4.82	4.72	4.77		4.74	0.17
EPT RICHNESS	13	15	14	18	22		15.0	2.2
% R.A. DOMINANT	41%	62%	37%	53%	52%		48%	12%
% R.A. FILTERERS	64%	84%	56%	76%	74%		70%	13%
METALS TOLERANCE	4.58	4.80	4.65	4.64	4.69		4.67	0.09
Baetidae/Ephemeroptera	0.36	0.62	0.44	0.47	0.48		0.47	0.11
Hydropsychinae/Trichoptera	0.77	0.94	0.91	0.84	0.87		0.86	0.08
EPT / (EPT + CHIR.)	0.71	0.74	0.58	0.70	0.69		0.68	0.07

B.23 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Superior - STATION 24 - 18 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						3%	32	
<i>Optioservus spp.</i>	23	15	14	37	89	2%	22.3	10.6
<i>Zaitzevia sp.</i>	19	6	5	4	34	1%	8.5	7.0
<i>Oreodytes spp.</i>	0	0	2	1	3	0%	0.8	1.0
DIPTERA						18%	193	
<i>Thienemannimyia gp.</i>	4	3	6	6	19	0%	4.8	1.5
<i>Pagastia sp</i>	1	2	2	2	7	0%	1.8	0.5
<i>Cricotopus spp.</i>	18	2	2	40	62	1%	15.5	18.0
<i>Eukiefferiella spp.</i>	4	0	0	0	4	0%	1.0	2.0
<i>Orthocladius spp.</i>	3	0	0	1	4	0%	1.0	1.4
<i>Tvetenia sp.</i>	19	9	8	24	60	1%	15.0	7.8
<i>Microtendipes sp</i>	7	3	6	2	18	0%	4.5	2.4
<i>Polypedilum spp.</i>	24	45	30	38	137	3%	34.3	9.2
<i>Rheotanytarsus sp.</i>	48	64	76	139	327	7%	81.8	39.9
<i>Tanytarsus sp.</i>	2	0	0	4	6	0%	1.5	1.9
<i>Micropsectra spp.</i>	13	10	15	45	83	2%	20.8	16.3
<i>Antocha sp.</i>	2	1	2	1	6	0%	1.5	0.6
<i>Simulium (Eusimulium)</i>	12	22	3	3	40	1%	10.0	9.1
EPHEMEROPTERA						8%	93	
<i>Acentrella insignificans</i>	2	3	6	1	12	0%	3.0	2.2
<i>Baetis tricaudatus</i>	18	25	11	7	61	1%	15.3	7.9
<i>Dipheter hageni</i>	0	0	1	1	2	0%	0.5	0.6
<i>Attenella margarita</i>	1	21	35	7	64	1%	16.0	15.2
<i>Serratella tibialis</i>	36	27	30	41	134	3%	33.5	6.2
<i>Drunella grandis</i>	7	1	2	7	17	0%	4.3	3.2
<i>Epeorus albertae</i>	1	1	1	2	5	0%	1.3	0.5
<i>Heptagenia sp.</i>	0	0	1	0	1	0%	0.3	0.5
<i>Rhithrogena sp.</i>	5	13	21	15	54	1%	13.5	6.6
<i>Paraleptophlebia bicornuta</i>	0	1	0	0	1	0%	0.3	0.5
<i>Paraleptophlebia sp.</i>	1	1	3	0	5	0%	1.3	1.3
<i>Tricorythodes minutus</i>	1	4	7	2	14	0%	3.5	2.6
LEPIDOPTERA								
<i>Petrophila sp.</i>	1	1	0	0	2	0%	0.5	0.6
PLECOPTERA						1%	9	
<i>Claassenia sabulosa</i>	3	2	3	8	16	0%	4.0	2.7
<i>Hesperoperla pacifica</i>	0	0	0	1	1	0%	0.3	0.5
<i>Isogenoides sp.</i>	3	8	4	5	20	0%	5.0	2.2

B.23 MACROINVERTEBRATE DATA								
CLARK FORK RIVER at Superior - STATION 24 - 18 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TRICHOPTERA						70%	773	
<i>Arctopsyche grandis</i>	4	0	0	3	7	0%	1.8	2.1
<i>Cheumatopsyche spp.</i>	412	241	234	473	1360	31%	340.0	121.0
<i>Hydropsyche occidentalis</i>	358	89	112	323	882	20%	220.5	139.6
<i>Hydropsyche cockerelli</i>	103	25	25	65	218	5%	54.5	37.4
<i>Hydroptila spp.</i>	3	4	1	8	16	0%	4.0	2.9
<i>Ceraclea sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Oecetis sp.</i>	1	1	7	2	11	0%	2.8	2.9
<i>Psychomyia flava</i>	4	2	7	0	13	0%	3.3	3.0
<i>Brachycentrus occidentalis</i>	0	14	9	34	57	1%	14.3	14.4
<i>Glossosoma sp.</i>	120	179	138	90	527	12%	131.8	37.2
ANNELIDA						0%	1	
Lumbricidae	4	0	1	0	5	0%	1.3	1.9
MOLLUSCA						0%	0	
<i>Sphaeriidae</i>	0	0	1	0	1	0%	0.3	0.5
ID's by D. McGuire								
TOTAL ORGANISMS	1287	846	831	1442	4406		1102	310
TAXA RICHNESS	36	34	36	35	44		35.3	1.0
SHAN. DIVERSITY	3.09	3.45	3.57	3.25	3.42		3.34	0.21
BIOTIC INDEX	4.36	3.67	3.82	4.52	4.18		4.09	0.41
EPT RICHNESS	19	21	21	20	25		20.3	1.0
% R.A. DOMINANT	32%	28%	28%	33%	31%		30%	2.4%
% R.A. FILTERERS	73%	54%	55%	72%	66%		64%	10%
METALS TOLERANCE	4.31	3.60	3.53	4.10	3.96		3.88	0.38
Baetidae/Ephemeroptera	0.28	0.29	0.15	0.11	0.20		0.21	0.09
Hydropsychinae/Trichoptera	0.87	0.64	0.70	0.86	0.80		0.77	0.12
EPT / (EPT + CHIR.)	0.88	0.83	0.82	0.78	0.83		0.83	0.04

B.24 MACROINVERTEBRATE DATA								
CLARK FORK RIVER above Flathead River - STATION 25 - 19 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						0%	3	
<i>Optioservus spp.</i>	0	5	2	3	10	0%	2.5	2.1
<i>Zaitzevia sp.</i>	1	2	0	0	3	0%	0.8	1.0
DIPTERA						30%	194	
<i>Thienemannimyia gp.</i>	6	25	5	3	39	1%	9.8	10.2
<i>Pagastia sp</i>	3	4	5	6	18	1%	4.5	1.3
<i>Cricotopus spp.</i>	8	46	13	17	84	3%	21.0	17.1
<i>Eukiefferiella spp.</i>	0	2	2	1	5	0%	1.3	1.0
<i>Orthocladius spp.</i>	0	0	2	2	4	0%	1.0	1.2
<i>Tvetenia sp.</i>	8	19	7	16	50	2%	12.5	5.9
<i>Microtendipes sp</i>	12	12	5	4	33	1%	8.3	4.3
<i>Phaenopsectra sp</i>	0	6	0	0	6	0%	1.5	3.0
<i>Polypedilum spp.</i>	6	42	7	5	60	2%	15.0	18.0
<i>Xenochironomus sp.</i>	40	72	27	18	157	6%	39.3	23.6
<i>Rheotanytarsus sp.</i>	32	85	37	59	213	8%	53.3	24.2
<i>Micropsectra spp.</i>	10	45	22	15	92	4%	23.0	15.5
<i>Antocha sp.</i>	0	1	3	4	8	0%	2.0	1.8
<i>Atherix pachypus</i>	0	1	1	0	2	0%	0.5	0.6
<i>Simulium (Eusimulium)</i>	1	0	2	0	3	0%	0.8	1.0
EPHEMEROPTERA						18%	119	
<i>Ameletus sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Acentrella insignificans</i>	11	18	23	25	77	3%	19.3	6.2
<i>Baetis tricaudatus</i>	1	2	0	1	4	0%	1.0	0.8
<i>Attenella margarita</i>	15	11	15	15	56	2%	14.0	2.0
<i>Serratella tibialis</i>	2	2	2	3	9	0%	2.3	0.5
<i>Ephemerella inermis</i>	1	0	0	0	1	0%	0.3	0.5
<i>Drunella grandis</i>	0	2	2	1	5	0%	1.3	1.0
<i>Timpango hecuba</i>	2	2	3	4	11	0%	2.8	1.0
<i>Epeorus albertae</i>	2	0	3	4	9	0%	2.3	1.7
<i>Heptagenia sp.</i>	36	41	50	72	199	8%	49.8	15.9
<i>Nixe sp.</i>	2	2	0	2	6	0%	1.5	1.0
<i>Rhithrogena sp.</i>	1	0	0	0	1	0%	0.3	0.5
<i>Stenonema sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Paraleptophlebia bicornuta</i>	8	7	7	3	25	1%	6.3	2.2
<i>Paraleptophlebia sp.</i>	12	16	25	8	61	2%	15.3	7.3
<i>Tricorythodes minutus</i>	3	1	5	0	9	0%	2.3	2.2

B.24 MACROINVERTEBRATE DATA								
CLARK FORK RIVER above Flathead River - STATION 25 - 19 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
LEPIDOPTERA								
<i>Petrophila sp.</i>	28	24	20	24	96	4%	24.0	3.3
PLECOPTERA						0%	3	
<i>Claassenia sabulosa</i>	0	1	2	1	4	0%	1.0	0.8
<i>Isogenoides sp.</i>	3	0	3	1	7	0%	1.8	1.5
TRICHOPTERA						46%	299	
<i>Arctopsyche grandis</i>	1	0	1	2	4	0%	1.0	0.8
<i>Cheumatopsyche spp.</i>	240	105	136	181	662	25%	165.5	58.7
<i>Hydropsyche occidentalis</i>	46	22	22	40	130	5%	32.5	12.4
<i>Hydropsyche cockerelli</i>	45	22	26	38	131	5%	32.8	10.6
<i>Hydroptila spp.</i>	0	7	0	3	10	0%	2.5	3.3
<i>Leucotrichia pictipes</i>	7	0	4	6	17	1%	4.3	3.1
<i>Zumatrichia notosa</i>	0	0	0	1	1	0%	0.3	0.5
<i>Ceraclea sp.</i>	7	7	12	9	35	1%	8.8	2.4
<i>Oecetis sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Psychomyia flavida</i>	29	66	42	55	192	7%	48.0	16.0
<i>Brachycentrus occidentalis</i>	3	2	1	3	9	0%	2.3	1.0
<i>Protophila sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Glossosoma sp.</i>	1	1	1	1	4	0%	1.0	0.0
ANNELIDA						1%	9	
Lumbricidae	3	6	7	9	25	1%	6.3	2.5
Naididae	0	2	0	0	2	0%	0.5	1.0
Erpobdellidae	2	2	1	3	8	0%	2.0	0.8
MOLLUSCA						0%	2	
<i>Physella sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Sphaeriidae</i>	1	0	1	4	6	0%	1.5	1.7
OTHER								
Porifera	1	1	1	1	4	0%	1.0	0.0
Turbellaria	0	0	0	2	2	0%	0.5	1.0
ID's by D. McGuire								

B.24 M A C R O I N V E R T E B R A T E D A T A								
CLARK FORK RIVER above Flathead River - STATION 25 - 19 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TOTAL ORGANISMS	640	741	555	678	2614		654	78
TAXA RICHNESS	39	42	41	46	56		42.0	2.9
SHAN. DIVERSITY	3.66	4.28	4.19	4.04	4.19		4.04	0.27
BIOTIC INDEX	4.43	4.57	4.15	4.37	4.39		4.38	0.17
EPT RICHNESS	23	21	21	27	31		23.0	2.8
% R.A. DOMINANT	38%	14%	25%	27%	25%		26%	9.6%
% R.A. FILTERERS	58%	32%	41%	48%	44%		45%	11%
METALS TOLERANCE	3.46	2.98	3.01	3.19	3.16		3.16	0.22
Baetidae/Ephemeroptera	0.13	0.19	0.17	0.19	0.17		0.17	0.03
Hydropsychinae/Trichoptera	0.87	0.64	0.75	0.76	0.77		0.76	0.10
EPT / (EPT + CHIR.)	0.79	0.49	0.74	0.77	0.69		0.70	0.14

B.25 MACROINVERTEBRATE DATA								
CLARK FORK RIVER above Thompson Falls Res. - STATION 27 - 19 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
COLEOPTERA						2%	5	
<i>Optioservus spp.</i>	2	4	2	1	9	1%	2.3	1.3
<i>Zaitzevia sp.</i>	1	2	2	1	6	1%	1.5	0.6
<i>Dubiraphia minima</i>	0	1	0	0	1	0%	0.3	0.5
Hydrophilidae	0	1	0	0	1	0%	0.3	0.5
<i>Deronectes sp.</i>	0	2	0	0	2	0%	0.5	1.0
DIPTERA						12%	36	
<i>Thienemannimyia gp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Cardiocladius spp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Cricotopus spp.</i>	4	3	4	8	19	2%	4.8	2.2
<i>Orthocladius spp.</i>	0	1	1	0	2	0%	0.5	0.6
<i>Synorthocladius sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Tvetenia sp.</i>	1	0	3	7	11	1%	2.8	3.1
<i>Microtendipes sp</i>	0	0	4	2	6	1%	1.5	1.9
<i>Polypedilum spp.</i>	3	0	5	1	9	1%	2.3	2.2
<i>Rheotanytarsus sp.</i>	22	21	24	14	81	7%	20.3	4.3
<i>Micropsectra spp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Simulium (Eusimulium)</i>	1	2	2	5	10	1%	2.5	1.7
EPHEMEROPTERA						8%	23	
<i>Acentrella insignificans</i>	4	0	3	10	17	1%	4.3	4.2
<i>Baetis tricaudatus</i>	0	3	3	1	7	1%	1.8	1.5
<i>Attenella margarita</i>	3	0	0	1	4	0%	1.0	1.4
<i>Serratella tibialis</i>	0	0	1	0	1	0%	0.3	0.5
<i>Drunella grandis</i>	1	0	0	0	1	0%	0.3	0.5
<i>Timpango hecuba</i>	4	0	0	0	4	0%	1.0	2.0
<i>Epeorus albertae</i>	0	1	0	1	2	0%	0.5	0.6
<i>Heptagenia sp.</i>	6	0	1	13	20	2%	5.0	5.9
<i>Rhithrogena sp.</i>	0	1	0	0	1	0%	0.3	0.5
<i>Stenonema sp.</i>	11	2	5	14	32	3%	8.0	5.5
<i>Tricorythodes minutus</i>	2	1	0	0	3	0%	0.8	1.0
LEPIDOPTERA								
<i>Petrophila sp.</i>	4	1	0	1	6	1%	1.5	1.7
ODONATA								
<i>Ophiogomphus sp.</i>	1	0	0	0	1	0%	0.3	0.5
PLECOPTERA						0%	1	
<i>Claassenia sabulosa</i>	0	0	0	1	1	0%	0.3	0.5
<i>Isogenoides sp.</i>	0	0	0	1	1	0%	0.3	0.5

B.25 M A C R O I N V E R T E B R A T E D A T A								
CLARK FORK RIVER above Thompson Falls Res. - STATION 27 - 19 AUG 95								
.								
Taxon	sample1	sample2	sample3	sample4	SUM	%RA	MEAN	S. D.
TRICHOPTERA						75%	216	
<i>Arctopsyche grandis</i>	0	1	0	0	1	0%	0.3	0.5
<i>Cheumatopsyche spp.</i>	74	101	187	254	616	54%	154.0	82.3
<i>Hydropsyche occidentalis</i>	5	0	2	2	9	1%	2.3	2.1
<i>Hydropsyche cockerelli</i>	12	9	21	44	86	8%	21.5	15.8
<i>Ceraclea sp.</i>	0	0	0	1	1	0%	0.3	0.5
<i>Psychomyia flavida</i>	4	0	0	2	6	1%	1.5	1.9
<i>Brachycentrus occidentalis</i>	0	0	1	0	1	0%	0.3	0.5
<i>Protoptila sp.</i>	1	3	2	2	8	1%	2.0	0.8
<i>Glossosoma sp.</i>	21	8	26	80	135	12%	33.8	31.8
ANNELIDA						1%	3	
Lumbricidae	2	0	0	0	2	0%	0.5	1.0
Lumbriculidae	3	1	4	1	9	1%	2.3	1.5
CRUSTACEA								
<i>Pacifasticus sp.</i>	0	0	0	1	1	0%	0.3	0.5
MOLLUSCA						1%	2	
<i>Physella sp.</i>	1	0	3	0	4	0%	1.0	1.4
<i>Sphaeriidae</i>	3	0	1	0	4	0%	1.0	1.4
OTHER								
Turbellaria	1	0	0	0	1	0%	0.3	0.5
ID's by D. McGuire								
TOTAL ORGANISMS	197	171	307	471	1146		287	136
TAXA RICHNESS	27	23	23	28	46		25.3	2.6
SHAN. DIVERSITY	3.44	2.46	2.36	2.45	2.78		2.68	0.51
BIOTIC INDEX	4.27	4.69	4.58	3.99	4.30		4.38	0.32
EPT RICHNESS	13	10	11	15	22		12.3	2.2
% R.A. DOMINANT	38%	59%	61%	54%	54%		53%	11%
% R.A. FILTERERS	59%	78%	78%	68%	71%		71%	9%
METALS TOLERANCE	3.44	4.18	4.19	4.01	3.99		3.95	0.36
Baetidae/Ephemeroptera	0.13	0.38	0.46	0.28	0.26		0.31	0.14
Hydropsychinae/Trichoptera	0.78	0.90	0.88	0.78	0.82		0.83	0.07
EPT / (EPT + CHIR.)	0.83	0.83	0.86	0.93	0.88		0.86	0.05

APPENDIX C:

**Metric values and bioassessment scores for Clark Fork Basin
monitoring stations, 1986-1995**

**C-1. Mean metric values and bioassessment scores for Blacktail Creek
above Grove Gulch: Station SF-1, August, 1993-1995 (4 Hess samples per year).**

	1993	1994	1995	Mean
Metric values				
Taxa richness	30	35	31	32
Shannon diversity	1.9	3.3	3.0	2.7
EPT/EPTC	0.20	0.76	0.54	0.50
Hydropsychinae/Trichoptera	0.58	0.97	1.00	0.85
Baetidae/Ephemeroptera	0.40	0.92	0.90	0.74
Biotic index	6.3	4.3	4.1	4.9
% Filterer	67	47	57	57
Density	1648	1670	2566	1961
EPT richness	10	13	10	11
Metals Tolerance index	6.6	6.0	5.5	6.0
Metric scores				
Taxa richness	4	5	4	4
Shannon diversity	2	5	5	4
EPT/EPTC	2	6	5	4
Hydropsychinae/Trichoptera	6	1	0	2
Baetidae/Ephemeroptera	6	3	4	4
Biotic index	2	5	5	4
% Filterer	2	6	4	4
Density (high)	6	6	5	6
Density (low)	6	6	6	6
EPT richness	3	3	3	3
Metals Tolerance index	3	3	4	3
Total	42	49	45	45
Organic subset	10	17	14	14
Metals subset	12	12	13	12
Bioassessment				
Overall	64%	74%	68%	69%
Organic subset	56%	94%	78%	76%
Metals subset	67%	67%	72%	69%

C-2. Mean metric values and bioassessment scores for Silver Bow Creek above the Butte WWTP: Station 00 - August, 1987-95 (four Hess samples per year).

	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values										
Taxa richness	5	6	6	7	9	10	8	14	10	8
Shannon diversity	1.6	2.3	0.9	1.4	1.8	1.4	1.7	1.7	1.8	1.6
EPT/EPTC	0.03	0.03	0.00	0.00	0.01	0.01	0.00	0.02	0.01	0.01
Hydropsychinae/Trichoptera	1.00	0.75	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.97
Baetidae/Ephemeroptera	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.89
Biotic index	4.9	5.1	6.6	5.7	4.9	6.3	5.0	5.7	5.4	5.5
% Filterer	0	2	1	0	0	0	1	2	1	1
Density	26	46	175	362	344	167	247	607	278	250
EPT richness	0	1	0	1	1	1	1	2	1	1
Metals Tolerance index	9.3	9.2	9.7	9.4	9.2	9.3	9.4	9.4	9.1	9.3
Metric scores										
Taxa richness	0	0	0	0	0	0	0	0	0	0
Shannon diversity	1	3	0	0	2	0	1	1	2	1
EPT/EPTC	0	0	0	0	0	0	0	0	0	0
Hydropsychinae/Trichoptera	0	6	0	0	0	0	0	0	2	1
Baetidae/Ephemeroptera	0	0	0	0	6	0	0	0	0	1
Biotic index	4	4	1	3	4	2	4	3	3	3
% Filterer	6	6	6	6	6	6	6	6	6	6
Density (high)	*	*	*	*	*	*	*	6	*	6
Density (low)	0	0	2	4	3	2	2	6	3	2
EPT richness	0	0	0	0	0	0	0	1	0	0
Metals Tolerance index	0	0	0	0	0	0	0	0	0	0
Total	11	19	9	13	21	10	13	23	16	15
Organic subset	10	10	7	9	10	8	10	15	9	10
Metals subset	0	0	2	4	3	2	2	7	3	3
Bioassessment										
Overall	18%	32%	15%	22%	35%	17%	22%	35%	27%	25%
Organic subset	83%	83%	58%	75%	83%	67%	83%	83%	75%	77%
Metals subset	0%	0%	11%	22%	17%	11%	11%	39%	17%	14%

* not calculated if density is < 550

C.3. Mean metric values and bioassessment scores for Silver Bow Creek below the Butte WWTP: Station 01 - August, 1986-95 (four Hess samples per year).

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	7	6	11	5	7	11	11	11	8	11	9
Shannon diversity	1.1	1.7	1.5	1.0	1.2	2.1	2.0	1.2	0.7	1.9	1.4
EPT/EPTC	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydropsychinae/Trichoptera	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Baetidae/Ephemeroptera	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Biotic index	6.9	6.3	6.0	6.9	6.8	6.5	7.4	6.9	7.1	6.0	6.7
% Filterer	55	3	59	73	69	28	51	77	87	2	50
Density	628	118	1450	361	1763	473	315	2663	882	426	908
EPT richness	1	1	1	0	0	0	0	0	0	0	0
Metals Tolerance index	8.3	9.3	7.8	7.7	7.8	8.9	7.8	7.5	7.2	8.9	8.1
Metric scores											
Taxa richness	0	0	0	0	0	0	0	0	0	0	0
Shannon diversity	0	1	1	0	0	2	2	0	0	2	1
EPT/EPTC	0	0	0	0	0	0	0	0	0	0	0
Hydropsychinae/Trichoptera	0	0	0	0	0	0	0	0	0	0	0
Baetidae/Ephemeroptera	6	0	0	0	0	0	0	0	0	0	1
Biotic index	1	2	2	1	1	1	0	1	0	2	1
% Filterer	5	6	4	1	2	6	5	0	0	6	4
Density (high)	6	*	6	*	6	*	*	4	6	*	6
Density (low)	6	1	6	4	6	5	3	6	6	4	5
EPT richness	0	0	0	0	0	0	0	0	0	0	0
Metals Tolerance index	1	0	2	2	2	1	2	2	2	1	2
Total	25	10	21	8	17	15	12	13	14	15	18
Organic subset	12	8	12	2	9	7	5	5	6	8	10
Metals subset	7	1	8	6	8	6	5	8	8	5	6
Bioassessment											
Overall	38%	17%	32%	13%	26%	25%	20%	20%	21%	25%	24%
Organic subset	67%	67%	67%	17%	50%	58%	42%	28%	33%	67%	49%
Metals subset	39%	6%	44%	33%	44%	33%	28%	44%	44%	28%	34%

* not calculated if density is < 550

C-4. Mean metric values and bioassessment scores for Silver Bow Creek near Opportunity: Station 02.5* - August 1986-95 (four Hess samples per year).

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	9	11	14	11	8	11	16	13	14	10	12
Shannon diversity	2.1	2.3	2.1	2.6	2.2	2.3	2.9	1.7	2.3	2.2	2.3
EPT/EPTC	0.63	0.27	0.74	0.44	0.52	0.51	0.75	0.11	0.65	0.18	0.48
Hydropsychinae/Trichoptera	0.98	0.87	0.98	0.86	0.89	0.89	0.98	0.93	0.16	0.66	0.82
Baetidae/Ephemeroptera	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.75	1.00	1.00	0.98
Biotic index	4.0	4.9	5.4	3.8	4.3	4.7	4.6	4.3	4.1	4.5	4.5
% Filterer	53	21	73	39	51	51	71	12	77	18	47
Density	82	120	378	189	147	220	396	399	640	157	273
EPT richness	3	3	5	5	3	4	7	4	5	3	4
Metals Tolerance index	7.0	8.0	6.7	7.5	7.4	7.5	6.0	8.6	6.2	8.3	7.3
Metric scores											
Taxa richness	0	0	0	0	0	0	1	0	0	0	0
Shannon diversity	2	3	2	4	3	3	4	1	3	3	3
EPT/EPTC	6	3	6	4	5	5	6	1	6	2	4
Hydropsychinae/Trichoptera	1	5	1	5	4	4	1	3	6	6	4
Baetidae/Ephemeroptera	0	0	0	0	0	0	0	6	0	0	1
Biotic index	5	4	3	6	5	4	4	5	5	5	5
% Filterer	5	6	1	6	5	5	1	6	0	6	4
Density (high)	*	*	*	*	*	*	*	*	6	*	6
Density (low)	1	1	4	2	1	2	4	4	6	2	3
EPT richness	1	1	1	1	1	1	2	1	1	1	1
Metals Tolerance index	2	1	3	2	2	2	3	1	3	1	2
Total	23	24	21	30	26	26	26	28	36	26	27
Organic subset	10	10	4	12	10	9	5	11	11	11	9
Metals subset	4	3	8	5	4	5	9	6	10	4	6
Bioassessment											
Overall	38%	40%	35%	50%	43%	43%	43%	47%	55%	43%	44%
Organic subset	83%	83%	33%	100%	83%	75%	42%	92%	61%	92%	74%
Metals subset	22%	17%	44%	28%	22%	28%	50%	33%	56%	22%	32%

1986- 1992 data from Station 03.

* not calculated if density is < 550

C-5. Mean metric values and bioassessment scores for Silver Bow Creek below Warm Springs Ponds: Station 04.5* - August, 1986-95 (4 samples per year).

	1986	1987	1988	1989	1990	1991	1993	1994	1995	Mean
Metric values										
Taxa richness	16	16	18	16	13	16	29	30	27	20
Shannon diversity	2.4	1.6	2.5	2.7	2.1	1.9	3.0	3.2	2.9	2.5
EPT/EPTC	0.96	0.98	0.97	0.92	0.99	1.00	0.93	0.88	0.74	0.93
Hydropsychinae/Trichoptera	1.00	1.00	1.00	0.97	1.00	1.00	0.87	0.85	0.90	0.95
Baetidae/Ephemeroptera	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00
Biotic index	6.3	5.1	5.8	5.9	5.0	5.1	5.5	4.8	5.4	5.4
% Filterer	66	94	75	79	93	90	32	51	58	71
Density	2558	1648	2563	2574	3223	1952	940	3018	3609	2454
EPT richness	4	5	4	6	6	5	8	12	8	6
Metals Tolerance index	5.1	5.4	5.1	5.8	5.4	5.8	4.6	5.4	6.1	5.4
Metric scores										
Taxa richness	1	1	1	1	0	1	3	4	3	2
Shannon diversity	3	1	3	4	2	2	5	5	4	3
EPT/EPTC	6	6	6	6	6	6	6	6	6	6
Hydropsychinae/Trichoptera	0	0	0	1	0	0	5	5	4	2
Baetidae/Ephemeroptera	0	0	0	0	0	0	0	0	1	0
Biotic index	2	4	2	2	4	4	3	4	3	3
% Filterer	2	0	1	0	0	0	6	5	4	2
Density (high)	5	6	5	5	3	6	6	4	3	5
Density (low)	6	6	6	6	6	6	6	6	6	6
EPT richness	1	1	1	2	2	1	2	3	2	2
Metals Tolerance index	4	4	4	4	4	4	5	4	3	4
Total	30	29	29	31	27	30	47	46	39	34
Organic subset	9	10	8	7	7	10	15	13	10	10
Metals subset	11	11	11	12	12	11	13	13	11	12
Bioassessment										
Overall	45%	44%	44%	47%	41%	45%	71%	70%	59%	52%
Organic subset	50%	56%	44%	39%	39%	56%	83%	72%	56%	55%
Metals subset	61%	61%	61%	67%	67%	61%	72%	72%	61%	65%

* 1986-91 data from station 04.

**C-6. Mean metric values and bioassessment scores for Warm Springs Creek
near mouth: Station 06 - August, 1986-1995 (4 Hess samples per year).**

	1986	1987	1988	1989	1990	1991	1993	1994	1995	Mean
Metric values										
Taxa richness	17	24	26	27	29	30	30	32	30	27
Shannon diversity	3.3	3.6	3.8	3.5	3.6	3.5	3.1	3.8	3.5	3.5
EPT/EPTC	0.91	0.66	0.78	0.75	0.60	0.85	0.32	0.64	0.33	0.65
Hydropsychinae/Trichoptera	0.82	0.69	0.23	0.58	0.86	0.87	0.10	0.75	0.08	0.55
Baetidae/Ephemeroptera	0.97	0.64	0.12	0.92	0.90	0.53	0.88	0.83	0.92	0.75
Biotic index	3.7	4.1	5.2	4.5	4.8	4.2	4.2	4.0	4.2	4.3
% Filterer	20	20	9	20	26	49	34	40	21	27
Density	122	277	255	620	486	581	492	759	441	448
EPT richness	10	11	13	13	13	14	12	15	13	13
Metals Tolerance index	4.5	5.1	3.8	5.2	5.6	4.9	4.5	4.1	4.3	4.7
Metric scores										
Taxa richness	1	2	3	3	3	4	4	4	4	3
Shannon diversity	5	6	6	6	6	6	5	6	6	6
EPT/EPTC	6	6	6	6	6	6	3	6	3	5
Hydropsychinae/Trichoptera	6	6	6	6	6	6	6	6	6	6
Baetidae/Ephemeroptera	1	6	6	3	4	6	4	6	3	4
Biotic index	6	5	3	5	4	5	5	5	5	5
% Filterer	6	6	6	6	6	6	6	6	6	6
Density (high)	*	*	*	6	*	6	*	6	*	6
Density (low)	1	3	3	6	5	6	5	6	4	4
EPT richness	3	3	3	3	3	4	3	4	3	3
Metals Tolerance index	5	4	6	4	4	5	5	5	5	5
Total	40	47	48	54	47	60	46	60	45	50
Organic subset	12	11	9	17	10	17	11	17	11	13
Metals subset	9	10	12	13	12	15	13	15	12	12
Bioassessment										
Overall	67%	78%	80%	82%	78%	91%	77%	91%	75%	80%
Organic subset	100%	92%	75%	94%	83%	94%	92%	94%	92%	91%
Metals subset	50%	56%	67%	72%	67%	83%	72%	83%	67%	69%

* not calculated if density is < 550

**C-7. Mean metric values and bioassessment scores for Clark Fork River below
Warm Springs Creek: Station 07 - August, 1986-1995 (4 Hess samples per year).**

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	25	24	25	23	22	24	25	36	37	35	28
Shannon diversity	2.9	2.7	1.5	2.5	2.3	2.4	2.6	3.6	3.2	3.6	2.7
EPT/EPTC	0.97	0.95	0.98	0.93	0.91	0.94	0.94	0.61	0.85	0.64	0.87
Hydropsychinae/Trichoptera	1.00	0.90	0.96	0.98	0.99	0.99	0.96	0.95	0.89	0.72	0.93
Baetidae/Ephemeroptera	1.00	1.00	1.00	1.00	0.99	0.86	1.00	0.46	0.90	0.80	0.90
Biotic index	4.7	4.7	4.1	4.7	5.0	4.8	4.9	5.2	4.5	5.0	4.8
% Filterer	65	64	81	58	75	62	54	25	41	27	55
Density	847	959	2874	1151	2402	1397	1353	852	2894	2152	1688
EPT richness	10	10	11	10	11	11	12	15	15	16	12
Metals Tolerance index	5.0	5.0	4.9	5.0	5.2	5.3	5.0	4.6	4.6	5.6	5.0
Metric scores											
Taxa richness	3	2	3	2	2	2	3	5	5	5	3
Shannon diversity	4	4	1	3	3	3	4	6	5	6	4
EPT/EPTC	6	6	6	6	6	6	6	6	6	6	6
Hydropsychinae/Trichoptera	0	4	2	1	1	1	2	2	4	6	2
Baetidae/Ephemeroptera	0	0	0	0	1	5	0	6	4	6	2
Biotic index	4	4	5	4	4	4	4	3	5	4	4
% Filterer	3	3	0	4	1	3	5	6	6	6	4
Density (high)	6	6	4	6	5	6	6	6	4	5	5
Density (low)	6	6	6	6	6	6	6	6	6	6	6
EPT richness	3	3	3	3	3	3	3	4	4	4	3
Metals Tolerance index	4	4	5	4	4	4	4	5	5	4	4
Total	39	42	35	39	36	43	43	55	54	58	44
Organic subset	13	13	9	14	10	13	15	15	15	15	13
Metals subset	13	13	14	13	13	13	13	15	15	14	14
Bioassessment											
Overall	59%	64%	53%	59%	55%	65%	65%	83%	82%	88%	67%
Organic subset	72%	72%	50%	78%	56%	72%	83%	83%	83%	83%	73%
Metals subset	72%	72%	78%	72%	72%	72%	72%	83%	83%	78%	76%

**C-8. Mean metric values and bioassessment scores for Clark Fork River
at Deer Lodge: Station 09 - August, 1986-1995 (4 Hess samples per year).**

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	24	28	26	32	26	28	28	29	26	26	27
Shannon diversity	1.7	2.3	2.3	2.3	2.1	2.9	2.3	3.9	2.2	2.7	2.5
EPT/EPTC	0.98	0.94	0.77	0.87	0.94	0.91	0.94	0.81	0.95	0.71	0.88
Hydropsychinae/Trichoptera	1.00	0.95	0.99	0.93	0.96	0.70	0.99	0.73	0.99	0.96	0.92
Baetidae/Ephemeroptera	0.99	0.93	0.63	0.42	0.78	0.71	0.98	0.68	1.00	0.97	0.81
Biotic index	4.8	4.9	4.6	5.0	5.0	4.8	5.0	4.9	4.8	5.5	4.9
% Filterer	77	69	66	67	77	52	78	42	76	71	68
Density	1410	1555	3745	2150	3183	909	2283	569	2288	2135	2023
EPT richness	10	14	11	15	13	15	12	13	11	12	13
Metals Tolerance index	4.9	5.1	5.5	4.9	5.0	4.7	5.3	4.8	5.1	5.8	5.1
Metric scores											
Taxa richness	2	3	3	4	3	3	3	3	3	3	3
Shannon diversity	1	3	3	3	2	4	3	6	3	4	3
EPT/EPTC	6	6	6	6	6	6	6	6	6	6	6
Hydropsychinae/Trichoptera	0	2	1	3	2	6	1	6	1	2	2
Baetidae/Ephemeroptera	1	3	6	6	6	6	1	6	0	1	4
Biotic index	4	4	4	4	4	4	4	4	4	3	4
% Filterer	0	2	2	2	0	5	0	6	0	1	2
Density (high)	6	6	3	5	4	6	5	6	5	5	5
Density (low)	6	6	6	6	6	6	6	6	6	6	6
EPT richness	3	4	3	4	3	4	3	3	3	3	3
Metals Tolerance index	5	4	4	5	4	5	4	5	4	4	4
Total	34	43	41	48	40	55	36	57	35	38	43
Organic subset	10	12	9	11	8	15	9	16	9	9	11
Metals subset	14	14	13	15	13	15	13	14	13	13	14
Bioassessment											
Overall	52%	65%	62%	73%	61%	83%	55%	86%	53%	58%	65%
Organic subset	56%	67%	50%	61%	44%	83%	50%	89%	50%	50%	60%
Metals subset	78%	78%	72%	83%	72%	83%	72%	78%	72%	72%	76%

C-9. Mean metric values and bioassessment scores for Clark Fork River above Little Blackfoot River: Station 10 - August, 1986-1995 (four Hess samples per year).

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	23	26	28	20	25	26	30	30	27	34	27
Shannon diversity	2.1	2.4	2.4	3.4	3.0	3.3	2.9	4.0	2.8	3.1	2.9
EPT/EPTC	0.92	0.91	0.62	0.83	0.77	0.91	0.92	0.81	0.91	0.65	0.83
Hydropsychinae/Trichoptera	0.99	0.94	0.81	0.53	0.73	0.44	0.95	0.60	0.93	0.94	0.79
Baetidae/Ephemeroptera	0.93	0.81	0.79	0.51	0.72	0.10	0.92	0.48	1.00	0.37	0.66
Biotic index	5.2	4.9	5.4	5.0	5.7	4.9	4.9	4.9	4.8	5.4	5.1
% Filterer	78	73	73	32	65	26	66	28	76	55	57
Density	3131	974	1688	448	1889	1615	1116	528	2388	3006	1678
EPT richness	11	14	12	11	14	15	15	15	16	16	14
Metals Tolerance index	5.3	5.1	5.4	4.9	5.5	4.7	5.2	4.8	5.0	5.5	5.1
Metric scores											
Taxa richness	2	3	3	2	3	3	4	4	3	4	3
Shannon diversity	2	3	3	6	5	5	4	6	4	5	4
EPT/EPTC	6	6	6	6	6	6	6	6	6	6	6
Hydropsychinae/Trichoptera	1	2	6	6	6	6	2	6	3	2	4
Baetidae/Ephemeroptera	3	6	6	6	6	6	3	6	0	6	5
Biotic index	3	4	3	4	3	4	4	4	4	3	4
% Filterer	0	1	1	6	3	6	2	6	0	5	3
Density (high)	4	6	6	*	6	6	6	*	5	4	5
Density (low)	6	6	6	4	6	6	6	5	6	6	6
EPT richness	3	4	3	3	4	4	4	4	4	4	4
Metals Tolerance index	4	4	4	5	4	5	4	5	4	4	4
Total	34	45	47	48	52	57	45	52	39	49	48
Organic subset	7	11	10	10	12	16	12	10	9	12	12
Metals subset	13	14	13	12	14	15	14	14	14	14	14
Bioassessment											
Overall	52%	68%	71%	80%	79%	86%	68%	87%	59%	74%	72%
Organic subset	39%	61%	56%	83%	67%	89%	67%	83%	50%	67%	66%
Metals subset	72%	78%	72%	67%	78%	83%	78%	78%	78%	78%	76%

* not calculated if density is < 550

C-10. Mean metric values and bioassessment scores for Little Blackfoot River: Station 10.2 - August, 1993-1995 (4 Hess samples per year).

	1993	1994	1995	Mean
Metric values				
Taxa richness	40	42	41	41
Shannon diversity	3.9	4.2	4.2	4.1
EPT/EPTC	0.32	0.58	0.55	0.48
Hydropsychinae/Trichoptera	0.14	0.62	0.38	0.38
Baetidae/Ephemeroptera	0.30	0.88	0.57	0.58
Biotic index	4.3	4.1	4.4	4.2
% Filterer	10	40	31	27
Density	460	1413	906	926
EPT richness	20	22	22	21
Metals Tolerance index	3.3	4.4	4.4	4.0
Metric scores				
Taxa richness	6	6	6	6
Shannon diversity	6	6	6	6
EPT/EPTC	3	6	6	5
Hydropsychinae/Trichoptera	6	6	6	6
Baetidae/Ephemeroptera	6	4	6	5
Biotic index	5	5	5	5
% Filterer	6	6	6	6
Density (high)	*	6	6	*
Density (low)	5	6	6	6
EPT richness	5	6	6	6
Metals Tolerance index	6	5	5	5
Total	54	62	64	60
Organic subset	11	17	17	15
Metals subset	16	17	17	17
Bioassessment				
Overall	90%	94%	97%	94%
Organic subset	92%	94%	94%	94%
Metals subset	89%	94%	94%	93%

* not calculated if density is < 550

C-11. Mean metric values and bioassessment scores for Clark Fork River at Gold Creek Bridge: Station 11 - August, 1986-1995 (4 Hess samples per year).

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	29	30	35	32	25	34	37	39	39	37	34
Shannon diversity	3.3	2.9	3.8	2.9	3.2	3.6	3.4	4.3	3.6	3.6	3.5
EPT/EPTC	0.87	0.83	0.80	0.93	0.93	0.86	0.63	0.79	0.75	0.73	0.81
Hydropsychinae/Trichoptera	0.76	0.79	0.93	0.23	0.90	0.56	0.54	0.58	0.83	0.90	0.70
Baetidae/Ephemeroptera	0.51	0.49	0.40	0.20	0.92	0.18	0.24	0.37	0.84	0.60	0.48
Biotic index	4.8	5.1	4.2	4.9	5.2	5.0	5.9	4.8	4.5	5.0	4.9
% Filterer	42	63	41	23	68	34	47	31	54	53	46
Density	838	1073	396	965	457	1446	1781	558	1265	906	969
EPT richness	15	17	18	18	13	19	17	21	24	19	18
Metals Tolerance index	4.8	5.3	4.4	4.6	5.5	5.1	5.5	4.6	4.5	5.0	4.9
Metric scores											
Taxa richness	3	4	5	4	3	4	4	5	5	5	4
Shannon diversity	5	4	6	4	5	6	6	6	6	6	5
EPT/EPTC	6	6	6	6	6	6	6	6	6	6	6
Hydropsychinae/Trichoptera	6	6	3	6	4	6	6	6	6	4	5
Baetidae/Ephemeroptera	6	6	6	6	3	6	6	6	6	6	6
Biotic index	4	4	5	4	3	4	2	5	5	4	4
% Filterer	6	3	6	6	2	6	6	6	5	5	5
Density (high)	6	6	*	6	*	6	6	6	6	6	6
Density (low)	6	6	4	6	5	6	6	6	6	6	6
EPT richness	4	4	5	5	3	5	4	5	6	5	5
Metals Tolerance index	5	4	5	5	4	4	4	5	5	4	5
Total	57	53	51	58	38	59	56	62	62	57	57
Organic subset	16	13	11	16	5	16	14	17	16	15	15
Metals subset	15	14	14	16	12	15	14	16	17	15	15
Bioassessment											
Overall	86%	80%	85%	88%	63%	89%	85%	94%	94%	86%	85%
Organic subset	89%	72%	92%	89%	42%	89%	78%	94%	89%	83%	82%
Metals subset	83%	78%	78%	89%	67%	83%	78%	89%	94%	83%	82%

* not calculated if density is < 550

**C-12. Mean metric values and bioassessment scores for Flint Creek at New Chicago:
Station 11.5 - August, 1993-1995 (four Hess samples per year).**

	1993	1994	1995	Mean
Metric values				
Taxa richness	30	34	35	33
Shannon diversity	1.7	3.1	3.8	2.8
EPT/EPTC	0.92	0.88	0.71	0.84
Hydropsychinae/Trichoptera	0.05	0.71	0.50	0.42
Baetidae/Ephemeroptera	0.38	0.86	0.69	0.64
Biotic index	3.1	4.3	4.2	3.9
% Filterer	78	68	52	66
Density	1137	1665	1501	1434
EPT richness	14	18	19	17
Metals Tolerance index	3.1	4.8	4.5	4.1
Metric scores				
Taxa richness	4	4	5	4
Shannon diversity	1	5	6	4
EPT/EPTC	6	6	6	6
Hydropsychinae/Trichoptera	6	6	6	6
Baetidae/Ephemeroptera	6	5	6	6
Biotic index	6	5	5	5
% Filterer	0	2	5	2
Density (high)	6	6	6	6
Density (low)	6	6	6	6
EPT richness	4	5	5	5
Metals Tolerance index	6	5	5	5
Total	51	55	61	56
Organic subset	12	13	16	14
Metals subset	16	16	16	16
Bioassessment				
Overall	77%	83%	92%	84%
Organic subset	67%	72%	89%	76%
Metals subset	89%	89%	89%	89%

C-13. Mean metric values and bioassessment scores for Clark Fork River at Bearmouth: Station 11.7 - August, 1993-1995 (4 Hess samples per year).

	1993	1994	1995	Mean
Metric values				
Taxa richness	44	39	35	39
Shannon diversity	3.7	2.9	2.6	3.1
EPT/EPTC	0.74	0.72	0.87	0.78
Hydropsychinae/Trichoptera	0.51	0.98	0.97	0.82
Baetidae/Ephemeroptera	0.18	0.92	0.74	0.61
Biotic index	5.1	5.2	5.0	5.1
% Filterer	14	61	74	50
Density	1808	3675	1809	2431
EPT richness	20	22	19	20
Metals Tolerance index	4.7	5.0	5.0	4.9
Metric scores				
Taxa richness	6	5	5	5
Shannon diversity	6	4	4	5
EPT/EPTC	6	6	6	6
Hydropsychinae/Trichoptera	6	1	1	3
Baetidae/Ephemeroptera	6	3	6	5
Biotic index	4	3	4	4
% Filterer	6	3	1	3
Density (high)	6	3	6	5
Density (low)	6	6	6	6
EPT richness	5	6	5	5
Metals Tolerance index	5	4	4	4
Total	62	44	48	51
Organic subset	16	9	11	12
Metals subset	16	16	15	16
Bioassessment				
Overall	94%	67%	73%	78%
Organic subset	89%	50%	61%	67%
Metals subset	89%	89%	83%	87%

C-.14. Mean metric values and bioassessment scores for Clark Fork River at Bonita: Station 12 - August, 1986-1995 (4 Hess samples per year).

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	26	34	31	29	23	37	34	34	30	34	31
Shannon diversity	2.2	3.1	2.4	3.0	2.3	2.2	2.5	3.4	2.9	2.8	2.7
EPT/EPTC	0.95	0.64	0.76	0.83	0.91	0.91	0.85	0.84	0.80	0.87	0.84
Hydropsychinae/Trichoptera	0.97	0.96	0.99	0.83	0.95	0.95	0.98	0.73	0.93	0.95	0.92
Baetidae/Ephemeroptera	0.94	0.48	0.90	0.88	0.92	0.91	0.98	0.17	0.87	0.69	0.77
Biotic index	4.7	5.1	4.7	5.2	5.0	5.0	5.2	4.7	4.8	4.8	4.9
% Filterer	63	52	69	60	72	74	67	33	64	68	62
Density	949	1228	8080	2227	1245	3153	3559	701	1926	1127	2420
EPT richness	13	16	15	15	13	17	15	17	16	17	15
Metals Tolerance index	4.7	4.9	5.0	5.1	5.1	5.2	5.1	4.5	4.9	4.8	4.9
Metric scores											
Taxa richness	3	4	4	3	2	5	4	4	4	4	4
Shannon diversity	3	5	3	5	3	3	3	6	4	4	4
EPT/EPTC	6	6	6	6	6	6	6	6	6	6	6
Hydropsychinae/Trichoptera	1	2	1	6	2	2	1	6	3	2	3
Baetidae/Ephemeroptera	2	6	4	4	3	3	1	6	5	6	4
Biotic index	4	4	4	3	4	4	3	4	4	4	4
% Filterer	3	5	2	4	1	1	2	6	3	2	3
Density (high)	6	6	0	5	6	4	3	6	6	6	5
Density (low)	6	6	6	6	6	6	6	6	6	6	6
EPT richness	3	4	4	4	3	4	4	4	4	4	4
Metals Tolerance index	5	5	4	4	4	4	4	5	5	5	5
Total	42	53	38	50	40	42	37	59	50	49	46
Organic subset	13	15	6	12	11	9	8	16	13	12	12
Metals subset	14	15	14	14	13	14	14	15	15	15	14
Bioassessment											
Overall	64%	80%	58%	76%	61%	64%	56%	89%	76%	74%	70%
Organic subset	72%	83%	33%	67%	61%	50%	44%	89%	72%	67%	64%
Metals subset	78%	83%	78%	78%	72%	78%	78%	83%	83%	83%	79%

**C-15. Mean metric values and bioassessment scores for Rock Creek near Clinton:
Station 12.5 - August, 1993-1995 (4 Hess samples per year).**

	1993	1994	1995	Mean
Metric values				
Taxa richness	36	35	37	36
Shannon diversity	3.0	3.8	4.0	3.6
EPT/EPTC	0.28	0.48	0.60	0.45
Hydropsychinae/Trichoptera	0.18	0.54	0.27	0.33
Baetidae/Ephemeroptera	0.26	0.26	0.34	0.29
Biotic index	3.8	3.6	3.6	3.7
% Filterer	10	17	20	16
Density	724	504	375	534
EPT richness	20	20	21	20
Metals Tolerance index	2.4	2.7	3.0	2.7
Metric scores				
Taxa richness	5	5	5	5
Shannon diversity	5	6	6	6
EPT/EPTC	3	5	6	5
Hydropsychinae/Trichoptera	6	6	6	6
Baetidae/Ephemeroptera	6	6	6	6
Biotic index	6	6	6	6
% Filterer	6	6	6	6
Density (high)	6	*	*	6
Density (low)	6	5	4	5
EPT richness	5	5	5	5
Metals Tolerance index	6	6	6	6
Total	60	56	56	57
Organic subset	18	12	12	14
Metals subset	17	16	15	16
Bioassessment				
Overall	91%	93%	93%	93%
Organic subset	100%	100%	100%	100%
Metals subset	94%	89%	83%	89%

* not calculated if density is < 550

**C-16. Mean metric values and bioassessment scores for Clark Fork River at Turah:
Station 13 - August, 1986-1995 (4 Hess samples per year).**

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	34	35	42	31	31	50	49	46	38	44	40
Shannon diversity	3.7	3.3	3.1	3.7	3.6	4.1	3.5	4.4	3.5	4.0	3.7
EPT/EPTC	0.63	0.81	0.80	0.77	0.61	0.63	0.72	0.76	0.73	0.68	0.71
Hydropsychinae/Trichoptera	0.81	0.92	0.96	0.85	0.54	0.75	0.93	0.85	0.89	0.70	0.82
Baetidae/Ephemeroptera	0.40	0.68	0.83	0.48	0.22	0.40	0.87	0.34	0.59	0.53	0.53
Biotic index	4.8	4.7	4.4	4.7	5.1	5.0	4.8	4.0	4.3	4.9	4.7
% Filterer	44	68	65	50	27	34	56	22	51	44	46
Density	1539	1708	5636	1725	2145	2164	2757	483	1078	1941	2118
EPT richness	17	19	23	17	16	26	26	26	20	25	21
Metals Tolerance index	5.0	4.8	4.8	4.6	5.3	5.1	4.7	3.5	4.2	5.2	4.7
Metric scores											
Taxa richness	4	5	6	4	4	6	6	6	5	6	5
Shannon diversity	6	5	5	6	6	6	6	6	6	6	6
EPT/EPTC	6	6	6	6	6	6	6	6	6	6	6
Hydropsychinae/Trichoptera	6	3	2	5	6	6	3	5	4	6	5
Baetidae/Ephemeroptera	6	6	6	6	6	6	5	6	6	6	6
Biotic index	4	4	5	4	4	4	4	5	5	4	4
% Filterer	6	2	3	6	6	6	4	6	5	6	5
Density (high)	6	6	0	6	5	5	4	*	6	6	5
Density (low)	6	6	6	6	6	6	6	5	6	6	6
EPT richness	4	5	6	4	4	6	6	6	5	6	5
Metals Tolerance index	4	5	5	5	4	4	5	6	5	4	5
Total	58	53	50	58	57	61	55	57	59	62	57
Organic subset	16	12	8	16	15	15	12	11	16	16	14
Metals subset	14	16	17	15	14	16	17	17	16	16	16
Bioassessment											
Overall	88%	80%	76%	88%	86%	92%	83%	95%	89%	94%	87%
Organic subset	89%	67%	44%	89%	83%	83%	67%	92%	89%	89%	79%
Metals subset	78%	89%	94%	83%	78%	89%	94%	94%	89%	89%	88%

* not calculated if <550

**C-17. Mean metric values and bioassessment scores for Blackfoot River at USGS:
Station 14 - August, 1986-1995 (4 Hess samples per year).**

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	21	31	36	28	31	30	41	37	39	42	34
Shannon diversity	4.0	3.3	4.0	4.0	4.1	4.1	2.8	3.9	4.0	3.6	3.8
EPT/EPTC	0.76	0.37	0.59	0.77	0.88	0.88	0.20	0.50	0.68	0.54	0.62
Hydropsychinae/Trichoptera	0.62	0.84	0.73	0.79	0.74	0.65	0.77	0.64	0.78	0.64	0.72
Baetidae/Ephemeroptera	0.49	0.49	0.71	0.37	0.28	0.47	0.50	0.41	0.44	0.35	0.45
Biotic index	3.4	4.8	4.8	3.7	3.5	3.6	4.4	4.1	4.0	3.7	4.0
% Filterer	19	17	32	42	45	30	7	19	37	26	27
Density	65	414	382	192	408	170	975	284	511	535	394
EPT richness	14	18	20	17	20	20	23	22	22	24	20
Metals Tolerance index	3.0	2.9	3.8	3.4	3.6	3.7	2.9	3.7	3.7	2.6	3.3
Metric scores											
Taxa richness	2	4	5	3	4	4	6	5	5	6	4
Shannon diversity	6	5	6	6	6	6	4	6	6	6	6
EPT/EPTC	6	4	6	6	6	6	2	5	6	5	5
Hydropsychinae/Trichoptera	6	6	6	6	6	6	6	6	6	6	6
Baetidae/Ephemeroptera	6	6	6	6	6	6	6	6	6	6	6
Biotic index	6	4	4	6	6	6	5	5	5	6	5
% Filterer	6	6	6	6	6	6	6	6	6	6	6
Density (high)	*	*	*	*	*	*	6	*	*	*	6
Density (low)	1	4	4	2	4	2	6	3	5	5	4
EPT richness	4	5	5	4	5	5	6	6	6	6	5
Metals Tolerance index	6	6	6	6	6	6	6	6	6	6	6
Total	49	50	54	51	55	53	59	54	57	58	54
Organic subset	12	10	10	12	12	12	17	11	11	12	12
Metals subset	11	15	15	12	15	13	18	15	17	17	15
Bioassessment											
Overall	82%	83%	90%	85%	92%	88%	89%	90%	95%	97%	89%
Organic subset	100%	83%	83%	100%	100%	100%	94%	92%	92%	100%	94%
Metals subset	61%	83%	83%	67%	83%	72%	100%	83%	94%	94%	82%

* not calculated if density is < 550

C-18. Mean metric values and bioassessment scores for Clark Fork River above Missoula: Station 15.5 - August, 1989-1995 (4 Hess samples per year).

	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values								
Taxa richness	29	25	32	39	36	37	47	35
Shannon diversity	3.4	2.8	3.2	3.7	4.0	3.5	3.5	3.5
EPT/EPTC	0.84	0.91	0.83	0.65	0.85	0.76	0.88	0.82
Hydropsychinae/Trichoptera	0.86	0.92	0.94	0.89	0.90	0.97	0.95	0.92
Baetidae/Ephemeroptera	0.71	0.51	0.82	0.96	0.30	0.66	0.40	0.62
Biotic index	4.3	4.1	4.5	5.0	3.8	4.6	4.3	4.4
% Filterer	67	79	64	53	48	58	67	62
Density	341	468	560	1841	384	1292	2090	997
EPT richness	18	16	16	21	21	20	27	20
Metals Tolerance index	4.3	4.0	4.6	5.2	3.4	4.7	4.3	4.4
Metric scores								
Taxa richness	3	3	4	5	5	5	6	4
Shannon diversity	6	4	5	6	6	6	6	6
EPT/EPTC	6	6	6	6	6	6	6	6
Hydropsychinae/Trichoptera	5	3	2	4	4	1	2	3
Baetidae/Ephemeroptera	6	6	6	2	6	6	6	5
Biotic index	5	5	5	4	6	4	5	5
% Filterer	2	0	3	5	6	4	2	3
Density (high)	*	*	6	6	*	6	5	6
Density (low)	3	5	6	6	4	6	6	5
EPT richness	5	4	4	5	5	5	6	5
Metals Tolerance index	5	5	5	4	6	5	5	5
Total	46	41	52	53	54	54	55	53
Organic subset	7	5	14	15	12	14	12	14
Metals subset	13	14	15	15	15	16	17	15
Bioassessment								
Overall	77%	68%	79%	80%	90%	82%	83%	80%
Organic subset	58%	42%	78%	83%	100%	78%	67%	72%
Metals subset	72%	78%	83%	83%	83%	89%	94%	83%

* not calculated if density is < 550

C-19. Mean metric values and bioassessment scores for Clark Fork River at Shuffields: Station 18 - August, 1986-1995 (4 Hess samples per year).

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	29	38	34	27	30	34	38	45	39	42	36
Shannon diversity	2.9	4.0	3.2	3.5	3.5	3.6	2.9	4.0	3.1	3.8	3.5
EPT/EPTC	0.90	0.79	0.90	0.82	0.86	0.75	0.91	0.70	0.84	0.60	0.81
Hydropsychinae/Trichoptera	0.96	0.75	0.71	0.92	0.73	0.81	0.83	0.73	0.92	0.81	0.82
Baetidae/Ephemeroptera	0.80	0.93	0.72	0.50	0.67	0.53	0.67	0.59	0.60	0.77	0.68
Biotic index	4.3	4.8	4.1	4.5	4.3	4.5	4.7	4.6	4.8	5.1	4.6
% Filterer	73	43	48	63	67	54	72	24	73	35	55
Density	584	1052	1360	830	932	627	1543	848	1725	1992	1149
EPT richness	16	20	18	16	19	19	22	22	22	22	20
Metals Tolerance index	4.2	4.6	4.7	4.5	4.2	4.7	4.4	4.6	4.7	5.3	4.6
Metric scores											
Taxa richness	3	5	4	3	4	4	5	6	5	6	5
Shannon diversity	4	6	5	6	6	6	4	6	5	6	5
EPT/EPTC	6	6	6	6	6	6	6	6	6	6	6
Hydropsychinae/Trichoptera	2	6	6	3	6	6	6	6	3	6	5
Baetidae/Ephemeroptera	6	3	6	6	6	6	6	6	6	6	6
Biotic index	5	4	5	5	5	5	4	4	4	4	5
% Filterer	1	6	6	3	2	5	1	6	1	6	4
Density (high)	6	6	6	6	6	6	6	6	6	6	6
Density (low)	6	6	6	6	6	6	6	6	6	6	6
EPT richness	4	5	5	4	5	5	6	6	6	6	5
Metals Tolerance index	5	5	5	5	5	5	5	5	5	4	5
Total	48	58	60	53	57	60	55	63	53	62	57
Organic subset	12	16	17	14	13	16	11	16	11	16	14
Metals subset	15	16	16	15	16	16	17	17	17	16	16
Bioassessment											
Overall	73%	88%	91%	80%	86%	91%	83%	95%	80%	94%	86%
Organic subset	67%	89%	94%	78%	72%	89%	61%	89%	61%	89%	79%
Metals subset	83%	89%	89%	83%	89%	89%	94%	94%	94%	89%	89%

C-20. Mean metric values and bioassessment scores for Bitterroot River near mouth: Station 19 - August, 1986-1995 (4 Hess samples per year).

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	31	35	39	33	30	36	34	37	29	41	35
Shannon diversity	3.5	3.7	3.4	3.8	3.5	3.8	3.1	4.3	2.9	3.9	3.6
EPT/EPTC	0.83	0.77	0.81	0.80	0.91	0.72	0.68	0.73	0.78	0.81	0.78
Hydropsychinae/Trichoptera	0.96	0.91	0.96	0.73	0.83	0.89	0.92	0.73	0.90	0.68	0.85
Baetidae/Ephemeroptera	0.65	0.55	0.84	0.35	0.48	0.34	0.63	0.18	0.55	0.08	0.47
Biotic index	4.7	4.8	4.6	4.2	4.4	4.6	4.9	4.0	4.7	4.0	4.5
% Filterer	65	63	63	58	66	56	69	35	81	45	60
Density	890	1085	1243	792	936	810	1421	334	1870	938	1032
EPT richness	16	20	21	19	17	18	18	21	14	22	19
Metals Tolerance index	4.7	4.4	4.8	3.8	4.4	4.9	4.7	3.1	4.6	3.9	4.3
Metric scores											
Taxa richness	4	5	5	4	4	5	4	5	3	6	5
Shannon diversity	6	6	6	6	6	6	5	6	4	6	6
EPT/EPTC	6	6	6	6	6	6	6	6	6	6	6
Hydropsychinae/Trichoptera	2	3	2	6	6	4	3	6	4	6	4
Baetidae/Ephemeroptera	6	6	6	6	6	6	6	6	6	6	6
Biotic index	4	4	4	5	5	4	4	5	4	5	4
% Filterer	3	3	3	4	2	4	2	6	0	6	3
Density (high)	6	6	6	6	6	6	6	*	6	6	6
Density (low)	6	6	6	6	6	6	6	3	6	6	6
EPT richness	4	5	5	5	4	5	5	5	4	6	5
Metals Tolerance index	5	5	5	6	5	5	5	6	5	6	5
Total	52	55	54	60	56	57	52	54	48	65	56
Organic subset	13	13	13	15	13	14	12	11	10	17	14
Metals subset	15	16	16	17	15	16	16	14	15	18	16
Bioassessment											
Overall	79%	83%	82%	91%	85%	86%	79%	90%	73%	98%	85%
Organic subset	72%	72%	72%	83%	72%	78%	67%	92%	56%	94%	76%
Metals subset	83%	89%	89%	94%	83%	89%	89%	78%	83%	100%	88%

* not calculated if < 550

**C-21. Mean metric values and bioassessment scores for Clark Fork River
at Harper Bridge: Station 20, August, 1986-1995 (4 Hess samples per year).**

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	28	33	31	29	28	32	39	31	31	41	32
Shannon diversity	2.9	3.2	2.5	3.5	3.1	3.3	3.2	1.4	3.2	3.1	2.9
EPT/EPTC	0.92	0.76	0.84	0.59	0.74	0.78	0.53	0.81	0.77	0.78	0.75
Hydropsychinae/Trichoptera	0.95	0.92	0.98	0.93	0.96	0.93	0.93	0.98	0.90	0.91	0.94
Baetidae/Ephemeroptera	0.86	0.84	0.85	0.66	0.72	0.62	0.83	0.75	0.68	0.43	0.72
Biotic index	4.7	4.9	4.5	5.4	5.2	4.7	5.4	4.9	4.7	4.9	4.9
% Filterer	68	68	74	52	64	61	47	90	67	63	65
Density	810	1519	4786	1391	1362	795	4369	4259	1658	2436	2339
EPT richness	16	15	16	15	15	16	19	18	16	20	17
Metals Tolerance index	4.7	4.8	5.1	5.5	5.1	4.7	5.7	4.9	4.4	4.8	5.0
Metric scores											
Taxa richness	3	4	4	3	3	4	5	4	4	6	4
Shannon diversity	4	5	3	6	5	5	5	1	5	5	4
EPT/EPTC	6	6	6	6	6	6	5	6	6	6	6
Hydropsychinae/Trichoptera	2	3	1	3	2	3	3	1	4	3	3
Baetidae/Ephemeroptera	5	6	5	6	6	6	6	6	6	6	6
Biotic index	4	4	5	3	3	4	3	4	4	4	4
% Filterer	2	2	1	5	3	3	6	0	2	3	3
Density (high)	6	6	1	6	6	6	2	2	6	5	5
Density (low)	6	6	6	6	6	6	6	6	6	6	6
EPT richness	4	4	4	4	4	4	5	5	4	5	4
Metals Tolerance index	5	5	4	4	4	5	4	5	5	5	5
Total	47	51	40	52	48	52	50	40	52	54	49
Organic subset	12	12	7	14	12	13	11	6	12	12	11
Metals subset	15	15	14	14	14	15	15	16	15	16	15
Bioassessment											
Overall	71%	77%	61%	79%	73%	79%	76%	61%	79%	82%	74%
Organic subset	67%	67%	39%	78%	67%	72%	61%	33%	67%	67%	62%
Metals subset	83%	83%	78%	78%	78%	83%	83%	89%	83%	89%	83%

**C-22. Mean metric values and bioassessment scores for Clark Fork River
at Huson: Station 22 - August, 1986-1995 (four Hess samples per year).**

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	28	42	33	32	30	33	40	32	29	31	33
Shannon diversity	2.5	3.4	2.8	3.9	3.7	2.7	3.3	3.0	2.5	2.9	3.1
EPT/EPTC	0.94	0.79	0.82	0.63	0.70	0.83	0.50	0.73	0.70	0.68	0.73
Hydropsychinae/Trichoptera	0.99	0.93	0.97	0.86	0.79	0.99	0.94	0.66	0.81	0.86	0.88
Baetidae/Ephemeroptera	0.94	0.40	0.81	0.45	0.29	0.78	0.87	0.47	0.59	0.47	0.61
Biotic index	4.8	4.9	4.6	4.9	4.3	4.8	5.3	4.6	4.6	4.7	4.8
% Filterer	75	60	71	43	40	71	57	57	77	70	62
Density	1396	1452	2680	819	516	882	2902	806	4296	1205	1695
EPT richness	16	21	17	18	17	17	20	15	15	15	17
Metals Tolerance index	4.9	4.9	4.9	4.5	4.0	4.9	5.0	4.3	4.5	4.7	4.7
Metric scores											
Taxa richness	3	6	4	4	4	4	6	4	3	4	4
Shannon diversity	3	6	4	6	6	4	5	5	3	4	5
EPT/EPTC	6	6	6	6	6	6	5	6	6	6	6
Hydropsychinae/Trichoptera	1	3	1	5	6	1	2	6	6	5	4
Baetidae/Ephemeroptera	2	6	6	6	6	6	5	6	6	6	6
Biotic index	4	4	4	4	5	4	3	4	4	4	4
% Filterer	1	4	1	6	6	1	4	4	0	2	3
Density (high)	6	6	4	6	*	6	4	6	2	6	5
Density (low)	6	6	6	6	5	6	6	6	6	6	6
EPT richness	4	5	4	5	4	4	5	4	4	4	4
Metals Tolerance index	5	5	5	5	5	5	4	5	5	5	5
Total	41	57	45	59	53	47	49	56	45	52	50
Organic subset	11	14	9	16	11	11	11	14	6	12	12
Metals subset	15	16	15	16	14	15	15	15	15	15	15
Bioassessment											
Overall	62%	86%	68%	89%	88%	71%	74%	85%	68%	79%	77%
Organic subset	61%	78%	50%	89%	92%	61%	61%	78%	33%	67%	67%
Metals subset	83%	89%	83%	89%	78%	83%	83%	83%	83%	83%	84%

* not calculated if density is < 550

**C-23. Mean metric values and bioassessment scores for Clark Fork River
near Superior: Station 24 - August, 1986-1995 (four Hess samples per year).**

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	31	34	36	28	33	33	44	34	28	35	34
Shannon diversity	3.5	3.5	3.3	2.8	3.8	3.8	3.7	3.9	3.1	3.3	3.5
EPT/EPTC	0.84	0.76	0.80	0.84	0.81	0.83	0.70	0.65	0.82	0.83	0.79
Hydropsychinae/Trichoptera	0.73	0.96	0.97	0.91	0.86	0.90	0.90	0.86	0.93	0.77	0.88
Baetidae/Ephemeroptera	0.80	0.54	0.61	0.42	0.53	0.70	0.19	0.36	0.58	0.21	0.49
Biotic index	4.4	5.0	4.7	4.8	4.6	4.5	4.9	4.4	4.5	4.1	4.6
% Filterer	55	61	61	74	56	54	49	53	74	64	60
Density	537	1100	2738	1088	725	463	955	975	2084	1102	1177
EPT richness	18	17	20	17	22	19	26	18	16	20	19
Metals Tolerance index	3.9	4.6	4.4	4.7	4.4	4.7	4.6	4.0	4.5	3.9	4.4
Metric scores											
Taxa richness	4	4	5	3	4	4	6	4	3	5	4
Shannon diversity	6	6	5	4	6	6	6	6	5	5	6
EPT/EPTC	6	6	6	6	6	6	6	6	6	6	6
Hydropsychinae/Trichoptera	6	2	1	3	5	4	4	5	3	6	4
Baetidae/Ephemeroptera	6	6	6	6	6	6	6	6	6	6	6
Biotic index	5	4	4	4	4	5	4	5	5	5	5
% Filterer	5	3	3	1	4	5	6	5	1	3	4
Density (high)	*	6	4	6	6	*	6	6	5	6	6
Density (low)	5	6	6	6	6	5	6	6	6	6	6
EPT richness	5	4	5	4	6	5	6	5	4	5	5
Metals Tolerance index	6	5	5	5	5	5	5	6	5	6	5
Total	54	52	50	48	58	51	61	60	49	59	54
Organic subset	10	13	11	11	14	10	16	16	11	14	13
Metals subset	16	15	16	15	17	15	17	17	15	17	16
Bioassessment											
Overall	90%	79%	76%	73%	88%	85%	92%	91%	74%	89%	84%
Organic subset	83%	72%	61%	61%	78%	83%	89%	89%	61%	78%	76%
Metals subset	89%	83%	89%	83%	94%	83%	94%	94%	83%	94%	89%

* not calculated if density is < 550

**C-24. Mean metric values and bioassessment scores for Clark Fork River
above the Flathead River: Station 25 - August, 1986-1995
(four Hess samples per year).**

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values											
Taxa richness	25	31	37	27	29	35	40	37	36	42	34
Shannon diversity	3.4	3.3	3.3	3.4	3.8	3.8	3.7	3.4	3.3	4.0	3.5
EPT/EPTC	0.79	0.66	0.66	0.61	0.58	0.71	0.64	0.55	0.46	0.70	0.64
Hydropsychinae/Trichoptera	0.70	0.90	0.96	0.98	0.91	0.96	0.91	0.95	0.91	0.76	0.89
Baetidae/Ephemeroptera	0.58	0.60	0.60	0.41	0.33	0.31	0.22	0.21	0.21	0.17	0.36
Biotic index	4.5	5.0	4.8	4.9	4.9	4.7	5.0	4.9	5.1	4.4	4.8
% Filterer	50	53	57	64	63	55	54	72	64	45	58
Density	249	1102	2097	1030	672	633	1355	684	1955	654	1043
EPT richness	14	15	20	15	17	16	20	19	18	23	18
Metals Tolerance index	3.7	3.9	3.9	4.3	3.8	4.6	4.7	3.1	3.3	3.2	3.9
Metric scores											
Taxa richness	3	4	5	3	3	5	6	5	5	6	5
Shannon diversity	6	5	5	6	6	6	6	6	5	6	6
EPT/EPTC	6	6	6	6	6	6	6	6	5	6	6
Hydropsychinae/Trichoptera	6	4	2	1	3	2	3	2	3	6	3
Baetidae/Ephemeroptera	6	6	6	6	6	6	6	6	6	6	6
Biotic index	5	4	4	4	4	4	4	4	4	5	4
% Filterer	6	5	4	3	3	5	5	1	3	6	4
Density (high)	*	6	5	6	6	6	6	6	6	6	6
Density (low)	2	6	6	6	6	6	6	6	6	6	6
EPT richness	4	4	5	4	4	4	5	5	5	6	5
Metals Tolerance index	6	6	6	5	6	5	5	6	6	6	6
Total	50	56	54	50	53	55	58	53	54	65	55
Organic subset	11	15	13	13	13	15	15	11	13	17	14
Metals subset	12	16	17	15	16	15	16	17	17	18	16
Bioassessment											
Overall	83%	85%	82%	76%	80%	83%	88%	80%	82%	98%	84%
Organic subset	92%	83%	72%	72%	72%	83%	83%	61%	72%	94%	79%
Metals subset	67%	89%	94%	83%	89%	83%	89%	94%	94%	100%	88%

* not calculated if density is < 550

C-25. Mean metric values and bioassessment scores for Clark Fork River above Thompson Falls Reservoir: Station 27 - August, 1987-1995
(four Hess samples per year).

	1987	1988	1989	1990	1991	1992	1993	1994	1995	Mean
Metric values										
Taxa richness	26	26	21	29	31	23	27	25	25	26
Shannon diversity	2.9	2.8	2.6	2.9	2.9	2.7	3.0	2.8	2.7	2.8
EPT/EPTC	0.79	0.91	0.58	0.83	0.87	0.79	0.51	0.93	0.86	0.79
Hydropsychinae/Trichoptera	0.96	0.94	0.98	0.91	0.93	0.98	0.88	0.83	0.83	0.92
Baetidae/Ephemeroptera	0.34	0.31	0.24	0.54	0.37	0.04	0.22	0.09	0.31	0.27
Biotic index	5.2	5.0	5.3	4.8	4.7	5.1	5.3	4.2	4.4	4.9
% Filterer	67	78	75	76	69	73	66	64	71	71
Density	525	851	838	520	486	627	313	463	287	546
EPT richness	12	12	9	17	18	9	11	13	12	13
Metals Tolerance index	4.9	4.5	4.2	4.2	5.1	3.9	2.8	4.0	4.0	4.2
Metric scores										
Taxa richness	3	3	2	3	4	2	3	3	3	3
Shannon diversity	4	4	4	4	4	4	5	4	4	4
EPT/EPTC	6	6	6	6	6	6	5	6	6	6
Hydropsychinae/Trichoptera	2	2	1	3	3	1	4	6	6	3
Baetidae/Ephemeroptera	6	6	6	6	6	6	6	6	6	6
Biotic index	3	4	3	4	4	4	3	5	5	4
% Filterer	2	0	1	0	2	1	2	3	1	1
Density (high)	*	6	6	*	*	6	*	*	*	6
Density (low)	5	6	6	5	5	6	3	5	3	5
EPT richness	3	3	2	4	5	2	3	3	3	3
Metals Tolerance index	5	5	5	5	4	6	6	6	6	5
Total	39	45	42	40	43	44	40	47	43	43
Organic subset	5	10	10	4	6	11	5	8	6	7
Metals subset	13	14	13	14	14	14	12	14	12	13
Bioassessment										
Overall	65%	68%	64%	67%	72%	67%	67%	78%	72%	69%
Organic subset	42%	56%	56%	33%	50%	61%	42%	67%	50%	51%
Metals subset	72%	78%	72%	78%	78%	78%	67%	78%	67%	74%

* not calculated if density is < 550

